

THE IRON AGE

THURSDAY, APRIL 26, 1888.

A New Double-Crank Press.

We present in this issue engravings of one of a series of six sizes of geared presses recently designed and built by the Ferracute Machine Company, of Bridgeton, N. J.

Many articles which have hitherto been produced in the shape of malleable castings can be made from heavy sheet iron or steel plate in presses and dies for a fraction of the cost of castings. The difficulty

It is more economical therefore to transfer pressure from the crank-shaft to the slide-bar from two points, making a double-crank press, than to use the single-crank principle. The two pitmen should be as near the ends of the shaft as possible, and the adjustment of the bar should be of such a character as to affect the pitmen simultaneously.

The heavy rugged appearance of the press shown is perhaps the most noticeable feature about it. The main details of the design are clearly shown in the two eleva-

wheel put on the main shaft. The weight of the press illustrated is about 9500 pounds. The width between columns in the clear is 32 inches; depth of bed (front to back), 24 inches; size of hole in bed, 24 x 16 inches; height to slide-bar when up, 12 inches; stroke of slide-bar, 2 inches, and adjustment of same, $1\frac{1}{2}$ inches. The sizes of the holes in the beds of the other presses of the series, which are of the same design, are 30 x 20 inches, 36 x 24 inches, 42 x 28 inches, 48 x 32 inches, and 54 x 36 inches respectively. The extreme height

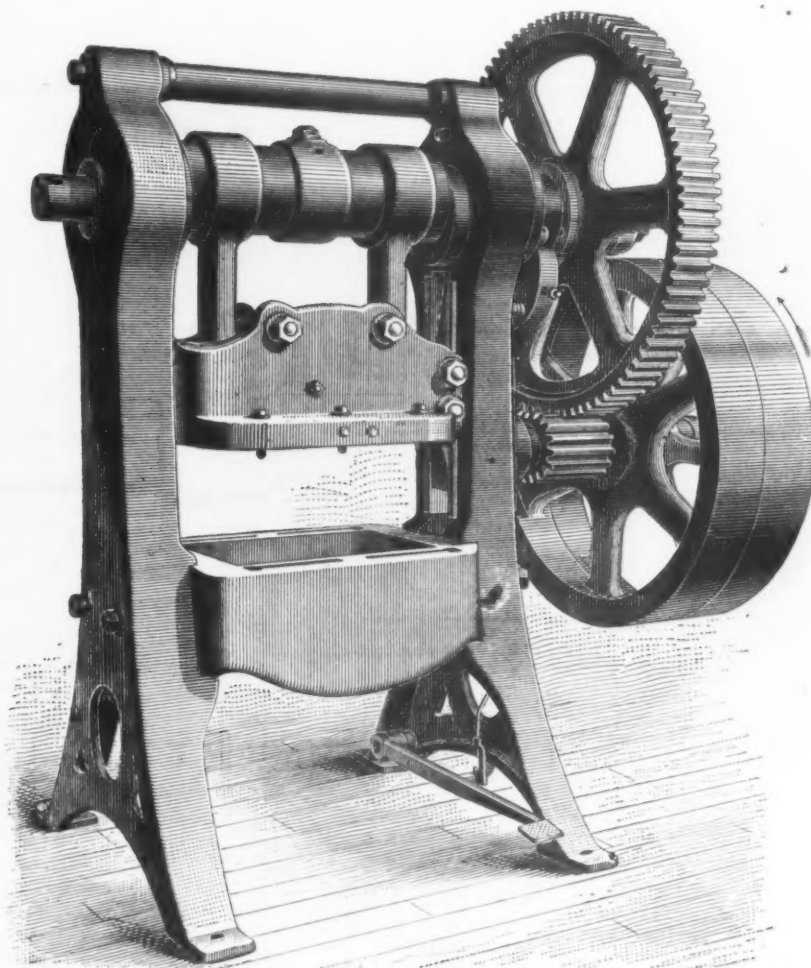


Fig. 1.—General View.

DOUBLE CRANK PRESS, BUILT BY THE FERRACUTE MACHINE COMPANY, BRIDGETON, N. J.

hitherto has been that the many makes and styles of presses in the market have been designed for thin sheet metals or for small punching and shearing only, and were not sufficiently heavy and strong for this kind of work. The particular machines in question are probably the heaviest double-crank presses now in the market for cutting or forming large diameters in such metal as $\frac{1}{2}$ -inch steel, and their performance has been found to fully meet expectations. Of course this kind of work can be done in single-crank presses, provided they are large enough, but more effect can be produced in the double-crank style for a given expenditure. The length of the slide bearings in single-crank presses should be in proportion to the diameter of the work, and consequently work of large diameter will require correspondingly high press frames.

tions and sections. There is an eccentric sleeve on the shaft, by means of which an adjustable stroke of from $1\frac{1}{2}$ to $3\frac{1}{2}$ inches is obtained. This sleeve is not usually put on the press unless ordered, the regular stroke being 2 inches. The slide-bar is adjusted up or down by another eccentric sleeve which works in both pitmen at the same time, and suitable mechanism is provided for firmly clamping this eccentric when the required height is obtained. An extra bolster plate fitted with die clamps adapting the press for small dies is also furnished, and all the presses of the series have the new form of adjustable automatic clutch, spring-brake, clamped gibs and other improvements peculiar to the Ferracute presses.

The Ferracute Company build a modification of these presses, in which the gearing is dispensed with and a heavy fly-

of the press as shown from the floor to the highest part is 7 feet 7 inches.

A new form of oil engine is at present being exhibited in England. It is known as Priestman's petroleum engine. In a tank in the bed of the engine is placed the petroleum, which is forced through a pipe into a compartment where the oil is converted into a fine spray by means of a blast of air. The spray passes into a chamber, is rendered explosive, and, coming in contact with an electric spark—obtained from a small battery in the rear—motive power is at once supplied. In construction it is said to be comparatively simple, and to work with admirable regularity. The piston requires no oiling, the petroleum vapor supplying the necessary lubrication.

A Fine Office Building.

The new office building on the corner of LaSalle and Adams streets, Chicago, known as "The Rookery," has become the home of so many iron and steel interests that a description of it will be appreciated by the trade generally. The claim has been made for this building that it is the

of Chicago, which now contains numerous specimens of noble architecture. The exterior is granite for the first two stories and reddish-brown brick and terra-cotta for the remainder of the superstructure. The frontage on LaSalle and Adams streets is highly ornamental. The windows are recessed in courses of two and three stories, the first and second stories

pattern. The constructional part of the building is thoroughly incombustible, even the ironwork so employed being covered with fire-proof material, while the floors are laid on hollow tile.

The interior is a central court open from the top, 75 feet square, pierced with unusually broad windows, the walls made of English cream-colored glazed en-

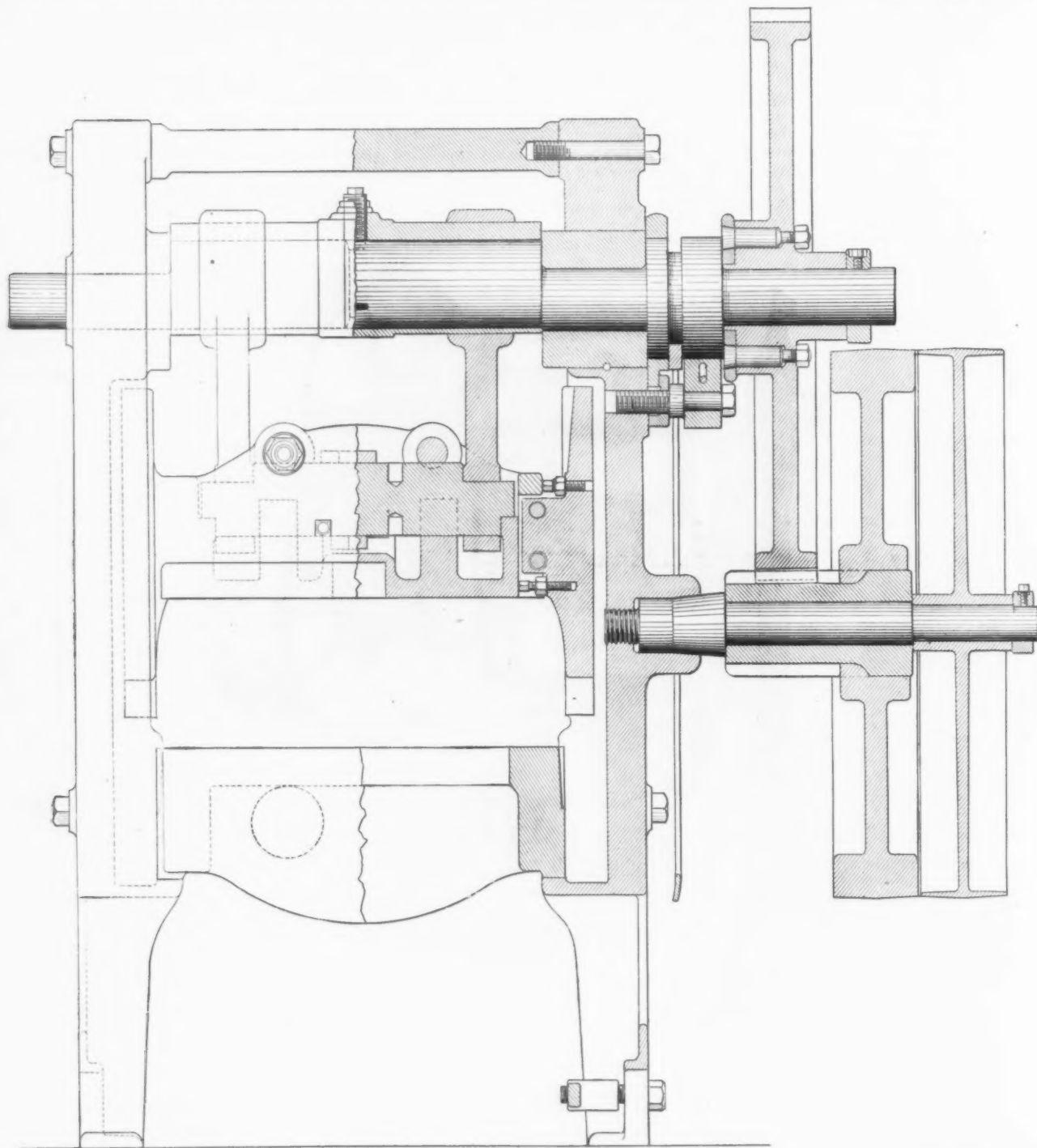


Fig. 2.—Front Elevation and Section.

NEW DOUBLE CRANK PRESS, BUILT BY THE FERRACUTE MACHINE COMPANY, BRIDGETON, N. J.

largest building in the world used for office purposes. While this is not a matter of absolute certainty, there is no doubt that it is the largest office building in this country outside of New York. It covers an area of 167 feet 6 inches by 177 feet 8 inches. It is 11 stories high, and the distance from the sidewalk to the cornice is 160 feet. The owners are the Central Safety Deposit Company, of Chicago, and its singular name is a legacy from its predecessor on a large part of its site.

This building is described as the most majestic building, structurally, in the city

being thus grouped, then the third and fourth, next the fifth, sixth and seventh; then the eighth, ninth and tenth, while the eleventh surmounts the whole in square finish of different design from the others. The windows of the seventh and tenth stories have circular heads. There are continuous bay windows on both fronts, with carved panels in terra-cotta. The general type of ornaments is East Indian. The piers are rounded from top to bottom and arches and lintels are formed upon the same radius by the use of brick of special

ameled brick, with glazed terra-cotta ornamentations, producing a pleasing effect and adding to the desirability of inside offices. The lower portion of the court is roofed over and skylighted 5 feet below the second story windows, forming a grand covered promenade, with a wide staircase leading to a gallery extending around all sides of the court, from which springs a glass-inclosed iron spiral staircase extending to the top of the building. The entrances and vestibules are finished in polished white marble and onyx. The floor of the main entrance and the court

is composed of mosaic and is claimed to be the largest piece of such work in this country, having been laid by skilled Italian workmen brought to this country for that purpose.

Twelve Hale hydraulic elevators are used for transporting passengers and freight, ten of them being used exclusively for passengers. Three Worthington pumps supply the hydraulic elevators, and when put in place they were the largest pumps in use in Chicago outside of the city water-works. Four other Worthington pumps

The marble for the interior was furnished by Davidson & Sons. The woodwork, which is of red oak, was finished and fitted by George A. Fuller. The electric lighting was intrusted to the Edison Company, who have installed probably the largest permanent plant in any building in the world, employing two Corliss engines and four dynamos of 800 16-candle power lights each, with the wiring all concealed from view. The fire-proofing was supplied by the Pioneer Fireproof Construction Company. The hardware, which

pipe. He introduced in this building the Durham system of sewerage. The steam-heating apparatus was supplied by E. F. Osborn & Co., of Minneapolis, Minn. A very important part of the work of construction was the architectural ironwork, which was supplied by the Dearborn Foundry Company. The glass consumed amounted to over 80,000 square feet, and was furnished by the James H. Rice Company. The brick used was made by the Chicago Anderson Pressed Brick Company, and the trimmings were supplied by the Northwestern Terra Cotta Company. The cost of this great structure is about \$1,500,000.

A Link Grinding Machine.

Messrs. Pedrick & Ayer, 1025 Hamilton street, Philadelphia, Pa., have just brought out an interesting new piece of machinery. It is a tool designed to quickly fit up hardened links and blocks. After the links are planed up they are case-hardened and always spring some. This makes it necessary to grind the space and the block. When ground free hand, the usual way, the space and block being ground so as to work freely, the true radius is always lost as the curve straightens. With the machine in question any radius, it is claimed, can be quickly ground true, either the block, link and face of the link. It consists of a frame, carrying an arm mounted with an emery-wheel. This has an automatic feed up and down, exposing all the surface of the wheel to the work, keeping the wheel true. It has also an automatic swinging movement over the arc of the circle to be ground. It is driven by an overhead countershaft and occupies small floor space.

Under the management of Prof. W. B. Potter, of the Washington University, the St. Louis Sampling and Testing Works have been built, for the purpose of affording those interested in mining an opportunity of testing and treating their ores on a working scale, so as to determine not only their value, but also, the best and cheapest method for their reduction. The plant includes the necessary apparatus for sampling, a three-stamp gold mill with blanket tables, reverbratory furnace, two amalgamation pans and plant for chlorination. The works have also a five-stamp silver battery and a concentrating mill, including a rock breaker; stamp battery, belt rolls for crushing, sizing screens, jigs and hydraulic separators. The works are equipped for testing fuel, there being complete machinery for washing coal and coal slack; a small coking oven and a return-flue steel boiler, with appliances for making complete fuel trials, including gas analyses. The laboratory has the necessary testing machinery, all the different departments being under the direct supervision of specialists.

The only system of forced draft which has been adopted on the ships of the British Navy is that of the closed stokehold plan, this appearing to be the simplest and best. The air pressure used in the large vessels is limited to 2 inches of water, but in torpedo-boats is often much higher. The result is that in the vessels thus fitted up the power obtained from a given weight of boilers and fittings will be about doubled, as compared with that obtained from boilers when worked by natural draft alone.

N. P. Hyndman, of Pittsburgh, who has been the general Western agent of the Connellsville Coke and Iron Company, of Philadelphia, for a number of years, has been appointed general sales agent of the company, with headquarters at No. 5 Sixth avenue in the first-named place.

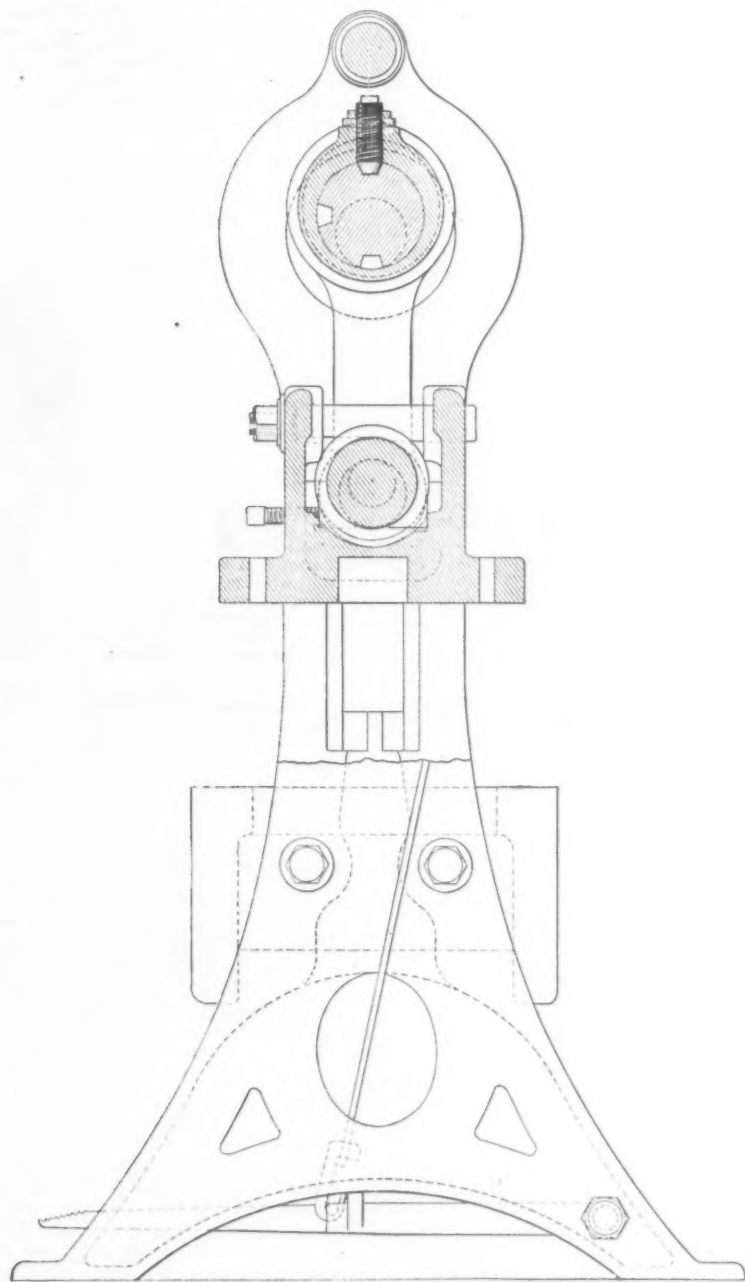


Fig. 3.—Side Elevation and Section.

NEW DOUBLE CRANK PRESS, BUILT BY THE FERRACUTE MACHINE COMPANY, BRIDGETON, N. J.

are used for supplying the offices and the steam boilers with water from the city mains. The pumping machinery has an aggregate capacity of 13,500,000 gallons in 24 hours.

Such a building required a vast amount of material and labor, and a number of the most prominent building firms and manufacturers of the country were engaged in its construction. The architects were Burnham & Root, whose artistic creations now adorn so many Western cities. The masonry of the exterior walls was carried to completion under the supervision of Mortimer & Tapper, now Mortimer & Son.

is cast iron, treated by the Bower-Barff process, was made by the Yale & Towne Mfg. Company after designs furnished by Burnham & Root upon plans originating with Orr & Lockett, the contractors. The safety vaults were equipped with the fittings and doors of the Hall's Safe and Lock Company. The painting and decorating were done by H. J. Milligan. The galvanized iron and copper in the skylights and the copper trimmings in the engine rooms and basement were the work of C. B. Rickert. The plumbing was done by E. Baggot, who used large quantities of the Raymond Lead Company's

Southern Pig Iron Freights.

The Queen and Crescent route via the Alabama Great Southern Railroad and the Cincinnati Southern Railway has issued, under date of April 10, the following tariff of rates on pig iron in carloads from Southern furnaces to points north, east and west. It supercedes tariff No. 2, issued February 1, 1888. It went into effect on April 1:

| Note. | To. | From. | | | |
|-------|-----------------------------------|----------------------------|--------------------|---|----------------|
| | | Dayton and Rockwood, Tenn. | Chattanooga, Tenn. | Attalla and Gadsden, Ala., Rising Fawn, Ga. | Wheeling, Ala. |
| | Adrian, Mich. | \$4.20 | \$4.40 | \$4.90 | \$4.90 |
| | Akron, Ohio | 3.65 | 3.85 | 4.35 | 4.35 |
| | Albion, Mich. | 4.20 | 4.40 | 4.90 | 4.90 |
| | Allegan, Mich. | 4.40 | 4.60 | 5.10 | 5.10 |
| | Allegheny, Pa. | 4.30 | 4.50 | 5.00 | 5.00 |
| 1 | Alton, Ill. | 3.66 | 3.86 | 4.11 | 3.86 |
| | Anderson, Ind. | 3.70 | 3.90 | 4.40 | 4.40 |
| 1 | Argenta, Ark. | 4.35 | 3.85 | 3.85 | 3.85 |
| | Ashland, Ky. | 2.75 | 2.95 | 3.45 | 3.45 |
| | Ashtabula, Ohio | 4.10 | 4.30 | 4.80 | 4.80 |
| 1 | Atchison, Kan. | 6.12 | 5.62 | 5.62 | 5.62 |
| | Athens, Ohio | 3.75 | 3.95 | 4.45 | 4.45 |
| 1 | Aurora, Ill. | 4.77 | 4.97 | 5.22 | 4.97 |
| | Aurora, Ind. | 2.40 | 2.60 | 3.10 | 3.10 |
| 3 | Batavia, Ill. | 4.90 | 5.10 | 5.35 | 5.35 |
| | Battle Creek, Mich. | 4.30 | 4.50 | 5.00 | 5.00 |
| | Bay City, Mich. | 4.65 | 4.85 | 5.35 | 5.35 |
| | Beaver Falls, Pa. | 4.40 | 4.60 | 5.10 | 5.10 |
| | Bellaire, Ohio | 4.30 | 4.50 | 5.00 | 5.00 |
| | Bellefontaine, Ohio | 3.60 | 3.80 | 4.30 | 4.30 |
| 3 | Beloit, Wis. | 5.17 | 5.37 | 5.62 | 5.62 |
| | Bloomington, Ill. | 4.40 | 4.60 | 4.85 | 4.85 |
| 3 | Brazil, Ind. | 3.65 | 3.85 | 4.10 | 4.10 |
| | Bridgeport, Ohio | 4.30 | 4.50 | 5.00 | 5.00 |
| | Buffalo, N. Y. | 4.40 | 4.60 | 5.10 | 5.10 |
| 1 | Burlington, Iowa | 4.92 | 5.12 | 5.37 | 5.12 |
| | Cadillac, Mich. | 5.40 | 5.60 | 6.10 | 6.10 |
| | Cambridge City, Ind. | 3.55 | 3.75 | 4.25 | 4.25 |
| | Canal Dover, Ohio | 4.00 | 4.20 | 4.70 | 4.70 |
| 3 | Canton, Ill. | 5.03 | 5.23 | 5.48 | 5.48 |
| | Canton, Ohio | 4.00 | 4.20 | 4.70 | 4.70 |
| 3 | Carpentersville, Ill. | 5.03 | 5.23 | 5.48 | 5.48 |
| 3 | Cedar Falls, Iowa | 6.17 | 6.37 | 6.62 | 6.62 |
| 1 | Cedar Rapids, Iowa | 5.67 | 5.87 | 6.12 | 5.87 |
| | Charleston, Ill. | 3.15 | 3.35 | 3.60 | 3.60 |
| | Charleston, W. Va. | 3.26 | 3.46 | 3.96 | 3.96 |
| | Chartiers, Pa. | 4.40 | 4.60 | 5.10 | 5.35 |
| | Chester, Ill. | 3.50 | 3.70 | 3.95 | 3.70 |
| 3 | Chicago, Ill. | 3.90 | 4.10 | 4.35 | 4.35 |
| | Chillicothe, Ohio | 3.40 | 3.60 | 4.10 | 4.10 |
| | Cincinnati, Ohio | 2.40 | 2.60 | 3.10 | 3.10 |
| | Cleveland, Ohio | 3.65 | 3.85 | 4.35 | 4.35 |
| 1 | Clinton, Iowa | 4.92 | 5.12 | 5.37 | 5.12 |
| | Colfax, Ind. | 3.80 | 4.00 | 4.50 | 4.50 |
| | Columbus, Ind. | 3.15 | 3.35 | 3.60 | 3.60 |
| | Columbus, Ohio | 3.15 | 3.35 | 3.85 | 3.85 |
| | Connerville, Ind. | 3.40 | 3.60 | 4.10 | 4.10 |
| 1 | Council Bluffs, Iowa | 6.12 | 5.62 | 5.62 | 5.62 |
| | Cuyahoga Falls, Ohio | 4.00 | 4.20 | 4.70 | 4.70 |
| | Danville, Ill. | 3.90 | 4.10 | 4.35 | 4.35 |
| 1 | Davenport, Iowa | 4.92 | 5.12 | 5.37 | 5.12 |
| | Dayton, Ohio | 3.15 | 3.35 | 3.85 | 3.85 |
| 1 | Decatur, Ill. | 3.90 | 4.10 | 4.35 | 4.35 |
| | Delaware, Ohio | 3.70 | 3.90 | 4.40 | 4.40 |
| 1 | Des Moines, Iowa | 5.42 | 5.62 | 5.87 | 5.62 |
| | Detroit, Mich. | 3.90 | 4.10 | 4.35 | 4.35 |
| 1 | Dixon, Ill. | 4.92 | 5.12 | 5.37 | 5.12 |
| 1 | Dubuque, Iowa | 5.08 | 5.28 | 5.53 | 5.28 |
| 3 | Dundee, Ill. | 5.22 | 5.42 | 5.67 | 5.67 |
| | Dunkirk, N. Y. | 4.40 | 4.60 | 5.10 | 5.10 |
| | East Saginaw, Mich. | 4.65 | 4.85 | 5.10 | 5.10 |
| 1 | East St. Louis, Ill. | 3.15 | 3.35 | 3.60 | 2.35 |
| 1 | Effingham, Ill. | 3.91 | 4.11 | 4.36 | 4.11 |
| 3 | Elgin, Ill. | 4.91 | 5.11 | 5.36 | 5.36 |
| | Elkhart, Ind. | 4.30 | 4.50 | 5.00 | 5.00 |
| | Elmira, N. Y. | 5.50 | 5.70 | 6.20 | 6.20 |
| 1 | Emporia, Kan. | 8.93 | 9.13 | 9.38 | 9.13 |
| | Erie, Pa. | 4.40 | 4.60 | 5.10 | 5.10 |
| 1 | Evansville, Ind. | 2.65 | 2.85 | 3.10 | 3.10 |
| 1 | Fort Scott, Kan. | 7.23 | 7.34 | 7.34 | 7.34 |
| 1 | Fort Smith, Ark. | 5.85 | 5.35 | 5.35 | 5.35 |
| | Fort Wayne, Ind. | 3.65 | 3.85 | 4.10 | 4.10 |
| | Fredericktown (Knox County), Ohio | 3.80 | 4.00 | 4.50 | 4.50 |
| 1 | Freeport, Ill. | 4.92 | 5.12 | 5.37 | 5.12 |
| 1 | Fremont, Neb. | 6.67 | 6.87 | 7.12 | 6.87 |
| | Fremont, Ohio | 4.00 | 4.20 | 4.70 | 4.70 |
| 3 | Galesburg, Ill. | 5.26 | 5.46 | 5.71 | 5.71 |
| | Galion, Ohio | 3.80 | 4.00 | 4.50 | 4.50 |
| 3 | Geneva, Ill. | 5.65 | 5.85 | 6.10 | 6.10 |
| | Goshen, Ind. | 4.30 | 4.60 | 5.00 | 5.00 |
| | Gosport, Ind. | 4.15 | 4.35 | 4.85 | 4.85 |
| 3 | Grand Crossing, Ill. | 3.90 | 4.10 | 4.35 | 4.35 |
| | Grand Rapids, Mich. | 4.40 | 4.60 | 5.10 | 5.10 |
| | Greencastle, Ind. | 3.65 | 3.85 | 4.35 | 4.35 |

| | | | | | |
|---|-----------------------------|------|------|------|------|
| 1 | Grinnell, Iowa | 5.95 | 6.12 | 6.37 | 6.12 |
| | Hamilton, Ohio | 3.10 | 3.30 | 3.80 | 3.80 |
| 1 | Hannibal, Mo. | 4.28 | 4.48 | 4.73 | 4.48 |
| | Harrisburg, Pa. | 5.60 | 5.80 | 6.30 | 6.30 |
| 1 | Havana, Ill. | 4.67 | 4.87 | 5.12 | 5.12 |
| | Havana, Ohio | 3.80 | 4.00 | 4.50 | 4.50 |
| | Hegewisch, Ill. | 3.90 | 4.10 | 4.35 | 4.35 |
| | Hillsboro, Ohio | 3.15 | 3.35 | 3.85 | 3.85 |
| | Hudson, Ohio | 4.00 | 4.20 | 4.70 | 4.70 |
| | Huntington, W. Va. | 2.87 | 3.07 | 3.57 | 3.57 |
| | Indianapolis, Ind. | 3.15 | 3.35 | 3.60 | 3.60 |
| | Ingersoll, Canada | 5.40 | 5.60 | 6.10 | 6.10 |
| 1 | Iowa City, Iowa | 5.68 | 5.88 | 6.13 | 5.88 |
| | Ironton, Ohio | 3.16 | 3.36 | 3.86 | 3.86 |
| | Jackson, Mich. | 4.20 | 4.40 | 4.90 | 4.90 |
| | Jacksonville, Ill. | 4.40 | 4.60 | 5.10 | 5.10 |
| 3 | Janesville, Wis. | 5.17 | 5.37 | 5.62 | 5.62 |
| 1 | Jeffersonville, Ind. | 2.65 | 2.85 | 3.10 | 3.10 |
| | Johnstown, Pa. | 5.50 | 5.70 | 6.20 | 6.20 |
| | Joliet, Ill. | 4.40 | 4.60 | 4.85 | 4.85 |
| | Jonesville, Mich. | 4.20 | 4.40 | 4.90 | 4.90 |
| 1 | Joplin, Mo. | 6.55 | 6.75 | 7.00 | 6.75 |
| | Kalamazoo, Mich. | 4.20 | 4.40 | 4.90 | 4.90 |
| 1 | Kansas City, Mo. | 6.12 | 5.62 | 5.62 | 5.62 |
| 3 | Kenosha, Wis. | 4.35 | 4.55 | 4.80 | 4.80 |
| 3 | Kensington, Ill. | 3.90 | 4.10 | 4.35 | 4.35 |
| | Kenton, Ohio | 3.70 | 3.90 | 4.40 | 4.40 |
| 1 | Keokuk, Iowa | 4.42 | 4.62 | 4.87 | 4.62 |
| 1 | Kewanee, Ill. | 4.57 | 4.77 | 5.02 | 4.77 |
| | Kokoma, Ind. | 3.90 | 4.10 | 4.60 | 4.60 |
| 1 | La Crosse, Wis. | 5.18 | 5.28 | 5.53 | 5.28 |
| | Lafayette, Ind. | 3.65 | 3.85 | 4.10 | 4.10 |
| 1 | Lamar, Mo. | 6.67 | 6.87 | 7.12 | 6.87 |
| | Lansing, Mich. | 4.30 | 4.50 | 5.00 | 5.00 |
| | La Porte, Ind. | 4.40 | 4.60 | 5.10 | 5.10 |
| 4 | Lawrence, Kan. | 9.42 | 8.93 | 8.93 | 8.93 |
| | Lawrenceburg, Ind. | 2.40 | 2.60 | 3.10 | 3.10 |
| 1 | Leavenworth, Kan. | 6.15 | 5.62 | 5.62 | 5.62 |
| 1 | Lefflers, Iowa | 5.45 | 5.62 | 5.87 | 5.62 |
| | Lima, Ohio | 3.40 | 3.60 | 4.10 | 4.10 |
| 1 | Lincoln, Neb. | 6.80 | 6.30 | 6.30 | 6.30 |
| 1 | Litchfield, Ill. | 3.15 | 3.35 | 3.60 | 3.60 |
| 1 | Little Rock, Ark. | 4.55 | 3.85 | 3.85 | 3.85 |
| 3 | Lockport, Ill. | 4.41 | 4.61 | 4.86 | 4.86 |
| | Logansport, Ind. | 3.80 | 4.00 | 4.50 | 4.50 |
| | London, Canada | 5.40 | 5.60 | 6.10 | 6.10 |
| | London, Ohio | 3.55 | 3.75 | 4.25 | 4.25 |
| 1 | Louisville, Ky. | 2.40 | 2.60 | 2.85 | 2.85 |
| 1 | Lyons, Iowa | 5.42 | 5.62 | 5.87 | 5.62 |
| | McKeesport, Pa. | 4.40 | 4.60 | 5.10 | 5.10 |
| | Madison, Ind. | 3.40 | 3.60 | 3.85 | 3.85 |
| 3 | Madison, Wis. | 5.32 | 5.52 | 5.77 | 5.77 |
| | Mansfield, Ohio | 3.65 | 3.85 | 4.35 | 4.35 |
| | Marietta, Ohio | 3.80 | 4.00 | 4.50 | 4.50 |
| | Marion (Marion County) Ohio | 3.80 | 4.00 | 4.50 | 4.50 |
| 1 | Marshalltown, Iowa | 5.53 | 5.73 | 5.98 | 5.73 |
| | Martin's Ferry, Ohio | 4.30 | 4.50 | 5.00 | 5.00 |
| | Massillon, Ohio | 4.10 | 4.30 | 4.80 | 4.80 |
| | Mattoon, Ill. | 3.65 | 3.85 | 4.10 | 4.10 |
| | Maysville, Ky. | 2.90 | 3.10 | 3.60 | 3.60 |
| | Medina, Ohio | 4.00 | 4.20 | 4.70 | 4.70 |
| 1 | Memphis, Tenn. | 2.85 | 2.35 | 2.35 | 2.35 |
| | Miamisburg, Ohio | 3.20 | 3.40 | 3.90 | 3.90 |
| | Michigan City, Ind. | 3.90 | 4.10 | 4.60 | 4.60 |
| | Milton, Ind. | 3.55 | 3.75 | 4.25 | 4.25 |
| 3 | Milwaukee, Wis. | 4.35 | 4.55 | 4.80 | 4.80 |
| | Mingo Junction, Ohio | 4.40 | 4.60 | 5.10 | 5.10 |
| 1 | Minneapolis, Minn. | 5.08 | 5.28 | 5.53 | 5.28 |
| | Mishawaka, Ind. | 4.40 | 4.60 | 5.10 | 5.10 |
| 1 | Moline, Ill. | 4.92 | 5.12 | 5.37 | 5.12 |
| 1 | Monmouth, Ill. | 4.92 | 5.12 | 5.37 | 5.12 |
| | Mount Vernon, Ohio | 3.80 | 4.00 | 4.50 | 4.50 |
| | Muncie, Ind. | 3.70 | 3.90 | 4.40 | 4.40 |
| 3 | Muscataine, Iowa | 5.17 | 5.37 | 5.62 | 5.62 |
| | Muskegon, Mich. | 4.65 | 4.85 | 5.10 | 5.10 |
| | Napoleon, Ohio | 4.00 | 4.20 | 4.70 | 4.70 |
| | Nelsonville, Ohio | 3.80 | 4.00 | 4.50 | 4.50 |
| 1 | New Albany, Ind. | 2.65 | 2.85 | 3.10 | 3.10 |
| | Newark, Ohio | 3.55 | 3.75 | 4.25 | 4.25 |
| | Newburgh, Ohio | 4.00 | 4.20 | 4.70 | 4.70 |
| | New Philadelphia | 4.00 | 4.20 | 4.70 | 4.70 |
| | Niles, Ohio | 4.10 | 4.30 | 4.80 | 4.80 |
| | North Vernon, Ind. | 3.40 | 3.60 | 4.10 | 4.10 |
| 1 | Omaha, Neb. | 6.12 | 5.62 | 5.62 | 5.62 |
| | Orrville, Ohio | 4.00 | 4.20 | 4.70 | 4.70 |
| | Oskaloosa, Iowa | 5.53 | 5.73 | 5.98 | 5.73 |
| 1 | Ottawa, Ill. | 4.77 | 4.97 | 5.22 | 4.97 |
| | Ottumwa, Iowa | 5.17 | 5.37 | 5.62 | 5.37 |
| 1 | Pana, Ill. | 3.15 | 3.35 | 3.60 | 3.60 |
| 3 | Paris, Ill. | 3.61 | 3.81 | 4.06 | 4.06 |
| | Parsons, Kan. | 8.75 | 8.25 | 8.25 | 8.25 |
| 1 | Pekin, Ill. | 4.25 | 4.45 | 4.70 | 4.70 |
| 3 | Peoria, Ill. | 3.90 | 4.10 | 4.35 | 4.35 |
| | Peru, Ind. | 3.80 | 4.00 | 4.50 | 4.50 |
| 1 | Pine Bluff, Ark. | 4.35 | 3.85 | 3.85 | 3.85 |
| | Piqua, Ohio | 3.30 | 3.50 | 4.00 | 4.00 |
| | Pittsburgh, Pa. | 4.30 | 4.50 | 5.00 | 5.00 |
| | Pomeroy, Ohio | 3.80 | 4.00 | 4.50 | 4.50 |
| | Port Huron, Mich. | 5.30 | 5.50 | 6.00 | 6.00 |
| | Portsmouth, Ohio | 3.65 | 3.85 | 4.35 | 4.35 |
| | Pullman, Ill. | 3.90 | 4.10 | 4.35 | 4.35 |
| 2 | Quincy, Ill. | 4.42 | 4.62 | 4.87 | 4.62 |
| 3 | Racine, Wis. | 4.35 | 4.55 | 4.80 | 4.80 |
| | Richmond, Ind. | 3.30 | 3.50 | 4.00 | 4.00 |
| 1 | Rock Falls, Ill. | 4.92 | 5.12 | 5.37 | 5.12 |
| 1 | Rockford, Ill. | 4.77 | 4.97 | 5.22 | 4.97 |
| 1 | Rock Island, Ill. | 4.92 | 5.12 | 5.37 | 5.12 |
| | Rushville, Ind. | 3.15 | 3.35 | 3.60 | 3.60 |
| | Rushville, Mich. | 4.65 | 4.85 | 5.10 | 5.10 |
| 3 | St. Charles, Ill. | 4.90 | 5.10 | 5.35 | 5.35 |
| | St. Charles, Mo. | 4.06 | 4.26 | 4.51 | 4.26 |
| | St. Cloud, Minn. | 7.84 | 8.04 | 8.29 | 8.04 |
| 1 | St. Joseph, Mo. | 6.12 | 5.62 | 5.62 | 5.62 |
| 1 | St. Louis, Mo. | 3.15 | 3.3 | 3.60 | 3.35 |

| | | | | | |
|---|-------------------------|------|------|------|------|
| 1 | St. Paul, Minn..... | 5.08 | 5.28 | 5.53 | 5.28 |
| | St. Thomas, Canada... | 5.00 | 5.20 | 5.70 | 5.70 |
| | Salem, Ohio..... | 4.10 | 4.30 | 4.80 | 4.80 |
| | Sandusky, Ohio..... | 3.85 | 4.05 | 4.55 | 4.55 |
| | Scottsville, Pa..... | 5.20 | 5.40 | 5.90 | 5.90 |
| 3 | Seneca, Ill..... | 3.90 | 4.10 | 4.35 | 4.35 |
| 3 | Sheboygan, Wis..... | 5.42 | 5.62 | 5.87 | 5.87 |
| | Shelby, Ohio..... | 3.80 | 4.00 | 4.50 | 4.50 |
| | Shelbyville, Ind..... | 3.15 | 3.35 | 3.60 | 3.60 |
| 1 | Sioux City, Iowa..... | 7.23 | 7.43 | 7.68 | 7.43 |
| 3 | South Bend, Ind..... | 3.90 | 4.10 | 4.35 | 4.35 |
| 1 | Springfield, Ill..... | 4.24 | 4.44 | 4.69 | 4.69 |
| 1 | Springfield, Mo..... | 6.71 | 6.21 | 6.21 | 6.21 |
| | Springfield, Ohio..... | 3.15 | 3.35 | 3.85 | 3.85 |
| 1 | Sterling, Ill..... | 4.92 | 5.12 | 5.37 | 5.12 |
| | Steubenville, Ohio..... | 4.30 | 4.50 | 5.00 | 5.00 |
| 1 | Stillwater, Minn..... | 5.53 | 5.73 | 5.98 | 5.73 |
| | Sturgis, Mich..... | 4.30 | 4.50 | 5.00 | 5.00 |
| 3 | Terre Haute, Ind..... | 3.15 | 3.35 | 3.60 | 3.60 |
| | Three Rivers, Canada... | 8.00 | 8.20 | 8.70 | 8.70 |
| | Three Rivers, Mich..... | 4.20 | 4.40 | 4.90 | 4.90 |
| | Tiffin, Ohio..... | 3.80 | 4.00 | 4.50 | 4.50 |
| | Titusville, Pa..... | 5.00 | 5.20 | 5.70 | 5.70 |
| | Toledo, Ohio..... | 3.65 | 3.85 | 4.35 | 4.35 |
| 1 | Topeka, Kan..... | 8.03 | 8.23 | 8.48 | 8.23 |
| | Toronto, Canada..... | 5.40 | 5.60 | 6.10 | 6.10 |
| | Troy, Ohio..... | 3.25 | 3.45 | 3.95 | 3.95 |
| | Union City, Ind..... | 3.50 | 3.70 | 4.20 | 4.20 |
| | Urbana, Ill..... | 4.40 | 4.60 | 5.10 | 5.10 |
| 1 | Van Buren, Ark..... | 5.85 | 5.55 | 5.35 | 5.35 |
| 1 | Vandalia, Ill..... | 3.88 | 4.06 | 4.31 | 4.06 |
| | Vernon, Ind..... | 3.85 | 4.05 | 4.55 | 4.55 |
| 1 | Vincennes, Ind..... | 3.40 | 3.60 | 3.85 | 3.85 |
| | Wabash, Ind..... | 3.90 | 4.10 | 4.60 | 4.60 |
| | Wheeling, W. Va..... | 4.30 | 4.50 | 5.00 | 5.00 |
| | Whitewater, Wis..... | 4.91 | 5.11 | 5.36 | 5.36 |
| | Wilmington, Del..... | 5.80 | 6.00 | 6.50 | 6.50 |
| 1 | Winona, Minn..... | 5.08 | 5.28 | 5.53 | 5.28 |
| | Wyandotte, Mich..... | 3.90 | 4.10 | 4.35 | 4.35 |
| | Xenia, Ohio..... | 3.20 | 3.40 | 3.90 | 3.90 |
| | Youngstown, Ohio..... | 4.10 | 4.30 | 4.80 | 4.80 |
| | Ypsilanti, Mich..... | 4.20 | 4.40 | 4.90 | 4.90 |
| | Zanesville, Ohio..... | 3.65 | 3.85 | 4.35 | 4.35 |

the producer may be introduced at the works mentioned for that department which is now being built to fill Government contracts for armament. It is rumored that the producer is likely to be consolidated in the near future with the interests of the Westinghouse fuel system of Pittsburgh.

A New Gate-Valve.

Messrs. Walter S. Payne & Co., of Fostoria, Ohio, are putting on the market a new gate-valve, of which we present sectional views. These very clearly explain its arrangement and manner of working.

Resting against the valve seats are two chisel-edged disks, which are provided with integral cross-bars arranged on their

When the disks are to be closed the stem is screwed down, forcing the steel wedge between the two disks, pressing them apart and causing them to be forced against their seats and close the valve. As an auxiliary to aid the steel wedge in pressing the disks to their places against the seats a flat spring is secured in the upper portion of the steel wedge, projecting outwardly on each side and adapted to engage with the top portion of each of the disks and force them down against their seats. In opening the disks the first part of a turn of the stem releases the wedge and the disks are perfectly free and are drawn up by the two horns on the wedge. By this construction there is no wear or sliding against the valve seats.

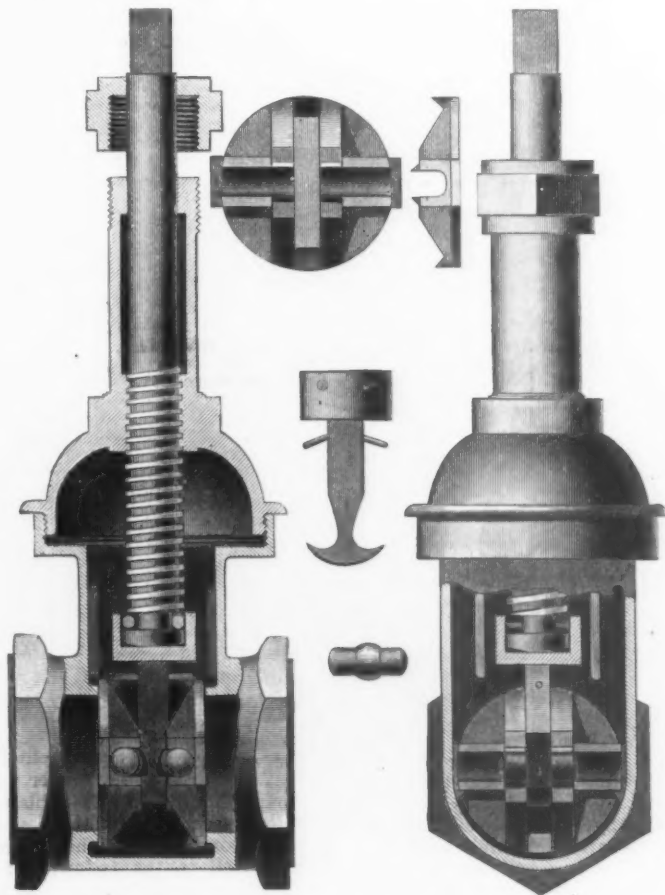
The valve, it will be noticed, has a very large stem, making it difficult to twist off

other directions are injuriously affected. The manufacturers of steel rails and other railway material have reason to feel particularly anxious over the dismal prospect for Western trade.

Coke Freights Reduced.

At a general railroad meeting, held in Chicago on Wednesday, the 18th inst., it was resolved to reduce the freight rates on coke about 5 per cent. Another meeting of the representatives of roads having connections with the Connellsville region was held in Pittsburgh on Thursday, the 19th inst., at which the new tariff was prepared. This last reduction of 5 per cent. is in addition to a former cut of 5 per cent., which went into effect on the 19th ult. It puts freights back to what they were in February, 1887. The reductions have been made for the purpose of aiding a revival of the iron business throughout the country. Furnace operators claimed that with the high rates of freight on coke and the high price of that article, it was cheaper for them to allow their furnaces to remain idle than to operate them. Now that a very substantial reduction has been made on both freights and coke, it is thought an improvement in the demand for pig iron will take place, and that a number of furnaces now idle will resume operations. Below we give the new rates of freight on coke, to take effect on Monday, the 23d inst., from the Connellsville region to points named, in tons of 2000 pounds:

| | |
|--|--------|
| Akron, Ohio..... | \$2.00 |
| Altamont, Ill..... | 3.50 |
| Alton, Ill..... | 3.50 |
| Anderson, Ind..... | 3.00 |
| Ansonia, Ohio..... | 2.90 |
| Arcanum, Ohio..... | 2.90 |
| Ashland, Ohio..... | 2.50 |
| Ashtabula, Ohio..... | 2.00 |
| Albany, N. Y..... | 3.10 |
| Bellefontaine, Ohio..... | 2.75 |
| Bradford, Pa..... | 2.40 |
| Brier Hill, Ohio..... | 1.50 |
| Brighton, Ohio..... | 2.90 |
| Beaver Falls, Pa..... | 1.40 |
| Boston, Mass..... | 4.50 |
| Buffalo, N. Y..... | 2.40 |
| Calro, Ill..... | 4.00 |
| Caledonia, Ohio..... | 2.70 |
| Carlisle (Franklin) Warren County, Ohio..... | 2.90 |
| Carmi, Ill..... | 4.00 |
| Carondelet, Mo..... | 3.65 |
| Carrollton, Montgomery County, Ohio..... | 2.90 |
| Carthage, Ohio..... | 2.90 |
| Cattaraugus, N. Y..... | 2.40 |
| Charleston, Ill..... | 3.50 |
| Chicago, Ill..... | 3.00 |
| Chrisman, Ill..... | 3.50 |
| Cincinnati, Ohio..... | 2.90 |
| Cleveland, Ohio..... | 2.00 |
| Coal Bluff, Ind..... | 3.00 |
| Connorsville, Ind..... | 3.00 |
| Corry, Pa..... | 2.40 |
| Crawfordsville, Ind..... | 3.00 |
| Crestline, Ohio..... | 2.55 |
| Creston, Ohio..... | 2.50 |
| Cumminsville, Ohio..... | 2.90 |
| Coalburg, Ohio..... | 1.50 |
| Dayton, Ohio..... | 2.75 |
| Delaware, Ohio..... | 2.60 |
| Detroit, Mich..... | 2.90 |
| East St. Louis, Ill..... | 3.50 |
| Edison, Ohio..... | 2.60 |
| Edwardsville Junction, Ill..... | 3.50 |
| Effingham, Ill..... | 3.50 |
| Eldorado, Ill..... | 4.00 |
| Elmwood, Ham'n County, Ohio..... | 2.90 |
| Erie, Pa..... | 2.00 |
| Enfield, Ill..... | 4.00 |
| Enon, Ohio..... | 2.75 |
| Evansville, Ind..... | 3.85 |
| Fairfield, Ill..... | 4.00 |
| Flora, Ill..... | 3.50 |
| Franklin, Warren County, Ohio..... | 2.90 |
| Franklin, Pa..... | 2.00 |
| Galion, Ohio..... | 2.55 |
| Garrettsville, Ohio..... | 2.00 |
| Girard, Ohio..... | 1.50 |
| Grafton, Ohio..... | 2.55 |
| Grayville, Ill..... | 3.50 |
| Great Valley, N. Y..... | 2.40 |
| Green Castle, Ind..... | 3.00 |
| Greenville, Darke County, Ohio..... | 2.90 |
| Greenville, Mercer County, Pa..... | 1.75 |
| Hamilton, Ohio..... | 2.90 |
| Hartwell, Ohio..... | 2.90 |
| Hubbard, Ohio..... | 1.50 |
| Haselton, Ohio..... | 1.50 |



NEW GATE VALVE, MADE BY WALTER S. PAYNE & COMPANY, FOSTORIA, OHIO.

inner faces and projecting slightly outward from the ends. They are adapted to rest upon stops arranged as shown in the right-hand cut, and forming part of the internal portion of the valve body. On the faces of the valve disks recesses are formed in which friction rollers are mounted. These are adapted to be engaged by two horns formed on the lower portion of a steel wedge arranged between the disks, and shown in detail. In the upper portion of the valve body two ribs are formed, and act as guides for the valve disks when raised to open the valve. The projecting portions of the bars on the disks also act as guides for them when they are raised by touching the side of the valve body and preventing them from becoming displaced from their proper line of elevation. When the valve stem is raised to open the valve, the horns on the previously mentioned steel wedge catch under the rollers and draw the disks upwards, causing them to bear against the ribs in the upper part of the valve case and to preserve their line of separation in direct alignment with the valve seats.

or bend. It is made in eight sizes, ranging from 2 to 12 inches.

Another war seems to be imminent among the Western railroads. The Chicago, Burlington and Quincy Railroad Company announce that they will not agree to sustain freight rates after May 10, and this notice is regarded as almost a declaration of war by the other companies penetrating the same territory. It is believed that if a second conflict is precipitated in this way its effects will be much more disastrous than the one which ended but a few weeks since. The sole cause of the trouble is the unremunerative condition of branch lines built in localities in which they were not needed, but for which business must be secured at the risk of immense losses on the parent system. If such a conflict could be confined in its effects to the railroad companies involved, its consequences would be of importance to stockholders and a matter of comparative indifference to others. But unfortunately this is not the case, as large interests in

| | |
|----------------------------------|------|
| Indianapolis, Ind. | 3.00 |
| Ivorydale, Ohio. | 2.90 |
| Jamestown, N. Y. | 2.40 |
| Jeffersonville, Ind. | 3.50 |
| Joliet, Ill. | 3.00 |
| Kansas, Ill. | 3.50 |
| Kent, Ohio. | 2.00 |
| Kenton, Ohio. | 2.75 |
| Lawrenceville, Ill. | 3.50 |
| Leavittsburg, Ohio. | 1.75 |
| Leetonia, Ohio. | 1.50 |
| Lima, Ohio. | 2.75 |
| Litchfield, Ill. | 3.50 |
| Little Valley, N. Y. | 2.40 |
| Lockland, Ohio. | 2.90 |
| Louisville, Ky. | 3.50 |
| Ludlow Falls, Ohio. | 2.90 |
| Lynn, Randolph County, Ind. | 2.90 |
| Lowellville, Ohio. | 1.50 |
| Mansfield, Ohio. | 2.50 |
| Mantua, Ohio. | 2.00 |
| Maplewood, Ohio. | 2.90 |
| Marion, Ohio. | 2.70 |
| Marshall, Ill. | 3.50 |
| Martel, Ohio. | 2.70 |
| Mattoon, Ill. | 3.50 |
| Meadville, Pa. | 2.00 |
| Mechanicsburg, Ohio. | 2.75 |
| Miamisburg, Ohio. | 2.90 |
| Middletown, Ohio. | 2.90 |
| Milford, Ohio. | 2.60 |
| Milwaukee, Wis. | 3.10 |
| Mitchell, Ind. | 3.50 |
| Mount Carmel, Ill. | 3.50 |
| Muncie, Ind. | 3.00 |
| New Albany, Ind. | 3.50 |
| Newburg, Ohio. | 2.00 |
| New Castle, Ind. | 3.00 |
| Niles, Ohio. | 1.50 |
| Norris City, Ill. | 4.00 |
| North Vernon, Ind. | 3.50 |
| New Castle, Pa. | 1.50 |
| New York City, N. Y. | 3.30 |
| Odin, Ill. | 3.50 |
| Oil City, Pa. | 2.00 |
| Olean, N. Y. | 2.40 |
| Olney, Ill. | 3.50 |
| Osborne, Ohio. | 2.75 |
| Oswego, N. Y. | 3.10 |
| Pana, Ill. | 3.50 |
| Paris, Ill. | 3.50 |
| Piqua, Ohio. | 2.75 |
| Princeton, Ind. | 3.85 |
| Pittsburgh, Pa. | 80 |
| Painesville, Ohio. | 2.00 |
| Randall, Ohio. | 2.00 |
| Randolph, N. Y. | 2.40 |
| Ravenna, Ohio. | 2.00 |
| Reno, Pa. | 2.00 |
| Richmond, Ind. | 2.00 |
| Robinson, Ill. | 3.50 |
| Rushville, Ind. | 3.00 |
| Rochester, N. Y. | 2.65 |
| St. Francisville, Ill. | 3.50 |
| Salamanca, N. Y. | 2.40 |
| Sandoval, Ill. | 3.50 |
| Sandusky, Ohio. | 2.75 |
| Seymour, Ind. | 3.50 |
| Sharon, Pa. | 1.50 |
| Sharpsville, Pa. | 1.50 |
| Shattuc, Ill. | 3.50 |
| Shawneetown, Ill. | 4.00 |
| Shelby, Ohio. | 2.55 |
| Shenango, Pa. | 1.75 |
| Sidney, Ohio. | 2.75 |
| Solon, Ohio. | 2.00 |
| Springfield, Ohio. | 2.75 |
| Sterling, Ohio. | 2.50 |
| Stewardson, Ill. | 3.50 |
| Sullivan, Ill. | 3.50 |
| Sullivan, Ind. | 3.50 |
| Struthers, Ohio. | 1.50 |
| Syracuse, N. Y. | 2.80 |
| Tallmadge, Ohio. | 2.00 |
| Taylorville, Ill. | 3.50 |
| Tecumseh, Ohio. | 2.90 |
| Terre Haute, Ind. | 3.00 |
| Transfer, Pa. | 1.75 |
| Troy, Ohio. | 2.75 |
| Toledo, Ohio. | 2.75 |
| Union City, Ind. | 2.90 |
| Union City, Pa. | 2.40 |
| Urbano, Ohio. | 2.75 |
| Utica, N. Y. | 3.00 |
| Vernon, Ohio. | 2.55 |
| Versailles, Ohio. | 2.90 |
| Vincennes, Ind. | 3.50 |
| Wadsworth, Ohio. | 2.50 |
| Wann, Ill. | 3.50 |
| Warren, M. D., Ohio. | 1.75 |
| Warren, M. L., Ohio. | 1.75 |
| Washington, Daviess County, Ind. | 3.50 |
| Wellington, Ohio. | 2.50 |
| West Middlesex, Pa. | 1.50 |
| Wheatland, Pa. | 1.50 |
| Winchester, Ind. | 2.90 |
| Windsor, Ill. | 3.50 |
| Youngstown, Ohio. | 1.50 |

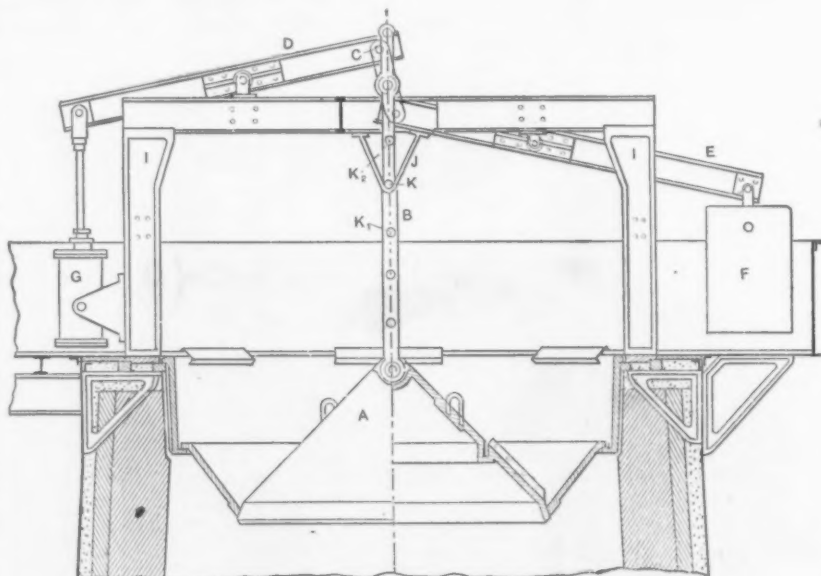
The decisions for March of the Canadian Customs Department fixed the following rates of duty: Diamond drill boring rods and couplings, 30 per cent.; Indurated

fibre ware, 35 per cent.; iron music stands, 35 per cent.; surgical instruments in cases, 35 per cent. on case and 20 per cent. on instruments; wooden pumps, with iron handles and spouts, 35 per cent.

New Device for Operating Blast-Furnace Charging Bells.*

BY FRANK CALVIN ROBERTS, C. E., PHILADELPHIA, PA.

An examination of the various devices employed for operating blast-furnace charging bells has led me to design the arrangement shown in the accompanying figure. In order to contribute to the even distribution of stock, the movement of the bell should be in a vertical line, since any tendency to side thrust which may be induced operates to the detriment of the even distribution of material. It is



THE ROBERTS CHARGING BELL.

also essential that a tight joint should be secured between the hopper ring and the lip of the bell. This is possible when the bell, in returning after each discharge, seats itself instantly and firmly around its entire base. These requirements render it highly desirable that any tendency to the vibration of the bell should be obviated, and that, to secure proper action, the center of suspension should move in a vertical line. Again, the high temperature to which the bell-rod is, at times, exposed, renders it necessary that some simple means should be provided for the adjustment of the bell to its seat.

These requirements are fulfilled in the design illustrated, in which D and E represent the bell beams pivoted to the eye beams H, and joined together at their extremities by the links C. From the centers of these links is suspended the bell A, by means of two rods, B. The steam cylinder G is connected to the bell beam B, and the weight of the bell is counterbalanced by the weight F, attached to the beam E. The operation of the device is evident. The dropping of the bell causes the centers of the link pins to travel in arcs of opposite directions—the point of suspension between them maintaining a neutral or vertical line. The adjustment of the bell to its seat is effected by varying the length of the piston-rod connection to the bell beam D by means of a clevis, with adjusting nuts on the piston-rod above and below the seat of the clevis. This adjustment may also be secured by the insertion

of a right-and-left nut (turn-buckle) between the clevis and the piston-rod.

The bell may be easily removed by a slight modification of a familiar device. The spacing of the holes K, K₁, K₂, &c., shown in the bell-rod B, is equal to the stroke of the bell cylinder. Straps, J, are riveted to each of the supporting beams H, and are of such length that, when the bell is seated, a pin may be inserted into the hole K, with the extremities resting on the straps. The weight of the bell is in this manner supported independently of the beams D and E. The link C may be disconnected from the bell-rod and lowered to a point where its center is opposite the hole K₂; connection being made between the link and the rod, steam is admitted to the top of the cylinder and the bell raised until the hole K₁ is opposite the lower extremity of J, when the insertion of a pin, as before, relieves the beams D and E of the weight of the bell. The opera-

tion, as described, is repeated until the bell is lifted clear of the hopper.

This design for operating blast-furnace bells, with the addition of an air-cushion cylinder, connected to the beam E, has been applied to the following furnaces: Three 18 x 75 foot furnaces for the Alabama and Tennessee Coal and Iron Company, Sheffield, Ala.; two 17 x 75 foot furnaces for the Sloss Steel and Iron Company, Birmingham, Ala.; one 15 x 65 foot furnace for the New York and Perry Coal and Iron Company, Shawnee, Ohio; two 12 x 60 foot furnaces for the Nashville Steel, Iron and Charcoal Company, Nashville, Tenn.; one 12 x 60 foot furnace for the Decatur Land Improvement and Furnace Company, Decatur, Ala.

Shares in Gogebic iron ore companies do not sell as readily as they did a twelve-month since. The following item from a Milwaukee source is of interest in this connection: "It took 50 minutes for Charles Shepherd to sell 2505 shares of Aurora stock in Glenway Maxon's office this afternoon for \$3.47 per share. The stock had been given by John E. Burton to H. M. Mygatt as security for a promissory note for \$20,000, dated November 15, at 6 per cent. interest. The stock was sold twice. First it was put up in eight parcels and brought \$8415, or a little less than \$2.90 per share. All but five shares were bought in by Mr. Mygatt. Before the sale a condition was imposed that if any one would raise the bid for the lot he could have it. A gentleman who was understood to be bidding for the Merchants'

* Read at the Boston meeting of the American Institute of Mining Engineers.

Exchange Bank bid \$3 per share for the lot. The bidding was then between him and Mr. Mygatt. Bids of 1 cent and 5 cents additional carried the price up to \$3.47, when it fell to H. Mygatt at that figure. The attendance at the sale was large."

The Curtis Balanced Steam Trap.

The Curtis Regulator Company, of Boston, Mass., have recently put on the market a modified and greatly improved form of the Edwards steam trap (see *The Iron Age*, September 1, 1887), and are selling it under the name of the Curtis balanced trap. The engravings which we annex, and for which we are indebted to Mr. Amos Aller, 109 Liberty street, New York, who is the agent for New York, New Jersey and Connecticut, fully explain the new design.

The pot is cylindrical, as in the old form, but has rounded ends, and is made amply strong for 150 pounds pressure. As in the new design of Curtis's return trap, the whole working mechanism is attached to a

The glass water-gauge is introduced for the purpose of enabling any one to observe, without guess-work, if the trap is working correctly, as when the gauge shows the water to be several inches above the discharge-valve it is impossible that any steam can escape. The uses of the trap we need scarcely point out, its adaptability being of a wide range.

Underbilling.

Report of the Interstate Commerce Commission.

From a report growing out of the investigations of the Interstate Commerce Commission on underbilling we quote the following: The attention of the commission has been attracted in various ways by allegations that the device known as "underbilling" is being largely employed by shippers and carriers as a method by which a less compensation is paid by one person than by another for a like and contempor-

have known, that such was the case. * * Notwithstanding the excuses offered, the officers must have been negligent. The inspection bureaus of the trunk lines and other roads are commended, but the commission will not accept this device as a substitute for the requirement that every carrier be responsible for the correctness of the weight and classification of the freight received, so far as the same can be practically ascertained.

The Commissioner then quotes from the evidence:

Sixty-one cars from the Michigan Central were weighed at Black Rock in February, 1888; of these the billing of 57 cars was short, in all 273,350 pounds, and 4 cars were overbilled, in all 4100 pounds. Of the cars underbilled the errors upon 20 exceeded 5000 pounds each, and on 4 exceeded 20,000 pounds each; while on 18 the errors were less than 1000 pounds each, in which case they are disregarded by the inspectors, a margin being necessary for variations of scales, differences in weight of cars when dry, when saturated

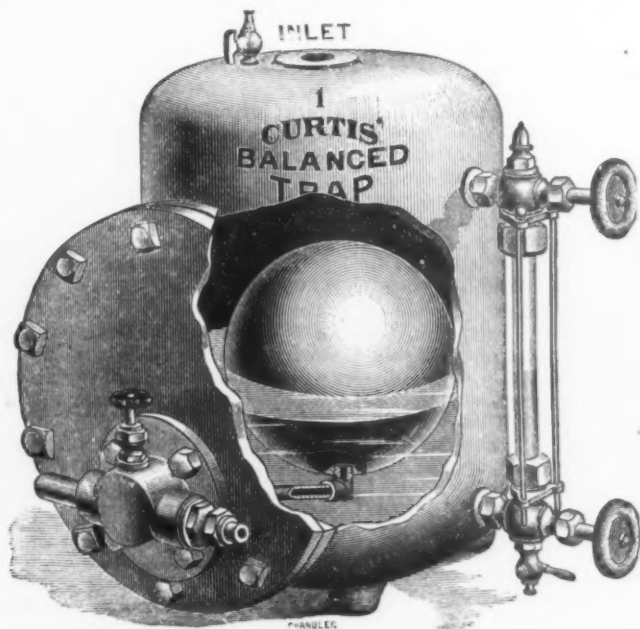


Fig. 1.—Sectional Perspective.

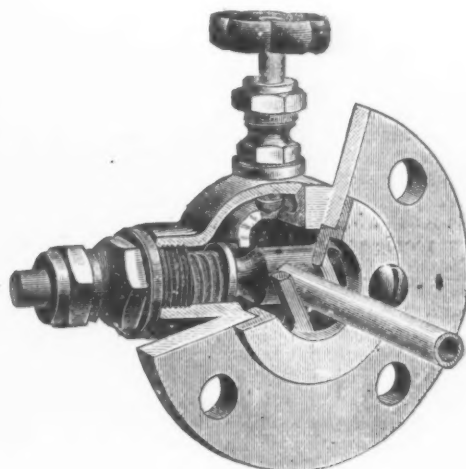


Fig. 2.—Detail of Valve.

NEW BALANCED STEAM TRAP, MADE BY THE CURTIS REGULATOR COMPANY, BOSTON, MASS.

plate at the side. It will be seen that when this plate is removed it brings away the float and valve with it, which can be taken, altogether, to any suitable place to be examined or repaired, leaving the pot in place and connected. The advantage of this arrangement is at once apparent.

The detail view, Fig. 2, explains the valve mechanism, showing the valve body cast with a flange to bolt it to the cover, with double seats, a passage over the top, connecting the outlets of the two seats, and an inlet from the trap to the seats. There is also an independent passage from the inlet to the outlet of the valve, controlled by a stop-valve. This is provided to meet cases of accident, and should the discharge-valve remain closed continue with the work and open the small valve; by so doing the water can be drained off until such time as the cause of the difficulty is ascertained. The valve is essentially the same in construction as in the old form of trap, being shifted, or opened and closed by the motion of the float-rod in an inclined slot. As the float drops the stem rests against the incline and is pushed laterally by it, forcing the valve to its seat. As the float rises the incline forces the valve open, while the slight rotary motion of the valve prevents it from sticking on its seat.

aneous service. It became the duty of the commission to investigate the subject, and such an investigation has accordingly been had. Time was not available for a full examination of the question in all parts of the country. * * * There is no doubt whatever, and the commission finds the fact to be, that an immense amount of traffic has been carried by the railroads of the country during the last six months, and to some extent during the entire period since the passage of the act to regulate commerce, the tonnage or weight of which was underbilled.

* * This has not been confined to any particular road or group of roads, but has been very generally prevalent in various parts of the United States, and even upon lines which at the same time were protesting most emphatically their absolute conformity to the requirements of the law. The practice is unequivocally condemned by every railroad official and traffic manager whom the commission has approached upon the subject, and they have been very many, including the officers of most of the leading lines in the Central and Western States. But at the same time the fact cannot be denied that the same lines have admitted traffic upon which the billing was short, and that usually they have known, or easily might

with moisture, when loaded with snow, or when not thoroughly cleaned, as well as for other reasonable corrections and possible minor errors. * *

Forty cars from the New York Central westbound were weighed at Suspension Bridge in February, and were found short, in all 109,280 pounds, or 8 per cent. of the total weight as way-billed. For example, a carload of iron billed at 32,000 pounds from Albany to Detroit was found to weigh 42,400 pounds; a carload of salt from Rochester to Chicago, billed at 24,000 pounds, was found to weigh 32,350 pounds. Other underbilling was in carloads of potatoes, cider, apples, glass, &c. Numerous examples are given of the most flagrant eastbound underbilling, corn weighing 36,000 pounds being billed 26,000, and lumber weighing 43,000 at 20,000. In all some 50 carloads of grain were shipped from Toledo to various points, of which the average underbilling was over 12,000 pounds per car, considerably more than 25 per cent. of the actual weight being thrown off.

* * Another cause of underbilling is found in the active competition for traffic, under the stress of which a vast number of soliciting agents are employed, whose officers are found not only on the corners of the most expensive streets of every city,

but in the rural communities as well, and who represent not only the carriers directly, but also various so-called "lines"—red, white or blue, as the case may be—whose only interest is to obtain traffic; who have little responsibility of their own or to their ultimate employers, and whose object in life is necessarily to make a record of success in securing business which shall warrant the continuance of their employment and of their pay. All this gilded advertisement and persistent solicitation in the end is paid for by the public. The business exists and the public service of transportation must be done, whether or not any agent intervenes to help along the contract. * * Without the most rigid supervision this system cannot fail to be dangerous. When soliciting agents are compensated by the payment of commissions the danger is largely increased. The division of a commission between the soliciting agent of a railroad or of a line and his customer obviously operates to give the shipper a lower rate of freight than the published schedule, and as the matter is within the control of the agent's employer the carrier which permits it is responsible for the violation of law involved.

A highly reputable merchant testified that he had been approached with a suggestion that one of his employees might be taken upon the salary list of a carrier if his firm would give their business to the road. A letter was produced, written by a shipper to another carrier, asking to be placed in some such position. * * The pretense of an employment or agency would not for a moment protect the carrier. There is reason for a belief that a critical inspection of pay rolls, vouchers and sub-vouchers by the responsible officials of many roads would disclose to them a startling recklessness on the part of their subordinates. One shipper was told that, while no rebates could be given upon shipments after April 5, 1887, if he would furnish a list of 100 cars shipped prior to that time they could be taken up for rebating, upon new freight being received of like amount. * * South Omaha packing houses have underbilled lard and provisions eastbound and have had the refrigerator cars returned from Chicago private sidings billed and carded as empty, when they were, in fact, loaded with nails, lumber, salt and other supplies needed at the packing houses. The Western Railway Association have got the packing house firms to sign an agreement allowing the roads to inspect their (the shippers') books, and this agreement has been in force since March 1, but the commission hesitates to accept it as a substitute for the performance by the carriers of their duty under the law to see that each shipper pays a just and exact amount.

The following instances of deceptive classification were found at Chicago and St. Louis on a single day:

| Articles. | Correct classification. | Description given by consignors. | Class. |
|----------------------|-------------------------|----------------------------------|--------|
| Pickles in glass ... | 1 | Barrels pickles... | 4 |
| Sassafras root ... | 1 | Tanner's bark ... | 3 |
| Bird cages..... | D1 | Box nested tin... | 2 |
| Twine..... | 1 | Jute..... | 4 |
| Acetic acid..... | D1 | Vinegar..... | 4 |
| Groceries..... | 1 | Dried fruit.... | 4 |
| Chewing gum.... | 1 | Candy..... | 3 |
| Glass bottles.... | 2 | Crockery..... | 4 |
| Glassware..... | 1 | Earthenware.... | 4 |
| Cotton bags..... | 1 | Burlaps..... | 4 |
| Hardware..... | 2 | Iron bolts..... | 4 |
| Printed matter... | 1 | Printing paper... | 3 |
| Looking-glass plate | 1 | Window glass.... | 4 |
| Drugs..... | 1 | Earth paint..... | 4 |

A car billed as "wooden-ware" was destroyed and a claim for \$1800 was presented, enumerating a large number of articles of merchandise, including brushes, drugs, stationery, and even a parlor organ. Boxes of stationery have been billed as hardware upon the justification that they

included one or two ink-erasers, &c. * * * This practice has assumed such proportions that all of the "house-freight" received at the larger Western cities is now opened and examined. Delay and annoyance result, but the increased revenue seems to justify the carriers.

It is not the desire or the purpose of the commission to relax in the least degree those requirements of the act to regulate commerce which hold carriers to a rigid responsibility for putting an end to all unjust discriminations and all undue or unreasonable preferences. It is the duty of the carriers to permit nothing whatever which can be construed as subjecting any person or locality "to any undue or unreasonable prejudice or disadvantage in any respect whatever." The application of these obligations to the carriers in various respects has been indicated above. It is clear that they have hitherto been seriously remiss, and while keeping within the letter of the prohibitions against "special rates, rebates and drawbacks," they have permitted, if not encouraged, the adoption and employment of other devices, especially the various forms of underbidding, which have produced the same result. * * *

It is proposed to amend the act by imposing a moderate penalty upon shippers who, by false billing, false classification, false weighing or false report of weight, or by other devices, knowingly and wilfully obtain transportation for their property at less than the regular rates. In view of the fact that unscrupulous persons are to be found in mercantile pursuits as well as in the employment of the railroads, that unjust discriminations obtained by means of these devices invariably operate to the direct pecuniary advantage of some shipper or consignee, that the evidence distinctly shows various instances and methods by which shippers have been able deliberately to defraud a carrier in the matter of transportation without fault or connivance on the part of the latter, and of the various other facts and considerations apparent in the foregoing pages, the proposed amendment is clearly necessary to make the act more thoroughly efficient. No manner is perceived in which the enforcement of such legislation can operate to the prejudice of honest shippers. Underbidding, in its devices and its fruits, must necessarily be participated in by the owner of the goods. It cannot be absolutely put down by imposing penalties upon the carriers alone. The complete termination of this practice is exceedingly to be desired, and there can be no doubt that this end will be greatly promoted by legislative recognition of the fact that not only the carrier, but the shipper also, who both participate in the methods and the results of unjust discrimination, are each responsible to the public for the wrong which every such transaction involves.

Amended Steamboat Regulations.

At the recent annual meeting at Washington of the Board of Supervising Inspectors of Steam Vessels a number of amendments were made to the existing steamboat rules, among them the following:

RULE II.

Section 6. No braces or stays hereafter employed in the construction of boilers shall be allowed a greater strain than 6000 pounds per square inch of section, and no screw stay-bolt shall be allowed to be used in the construction of marine boilers in which salt water is used to generate steam, unless said screw stay-bolt is protected by a socket. But such screw stay-bolts without socket may be used in staying the fire-boxes and furnaces of such boiler and not elsewhere, when fresh water is used for gener-

ating steam in said boilers, and no brace or stay-bolt used in a marine boiler will be allowed to be placed more than $8\frac{1}{2}$ inches from center to center. In allowing the strain on a screw stay-bolt, the diameter of the same shall be determined by the diameter at the bottom of the thread.

Section 9. Third example, paragraphs 3 and 4:

Paragraph 3. Lap-welded flues used in boilers carrying 100 pounds of steam or less, any flue over 10 feet and not over 15 feet in length shall have two wrought-iron rings attached to the flue externally, equidistant between the ends of the flue, and there shall be attached one additional ring for every 5 feet or fraction thereof over 15 feet in length.

Paragraph 4. All such rings shall be good and substantially made, and properly and securely attached to the flues, and shall have a thickness of material of not less than the thickness of the material of the flues, and a width of not less than $2\frac{1}{2}$ inches. Lap-welded flues used in boilers carrying over 100 pounds of steam shall have rings attached, as called for above, of not less than one and one-half the thickness of the material of the flue, and a width of not less than 3 inches; provided, however, where such flues are made in lengths of not over 5 feet, and fitted one into the other, and substantially riveted, the wrought-iron rings may be dispensed with.

Section 12. The feed-water shall not be admitted into any boiler, used in connection with a condensing engine, at a temperature less than 100° F. (for low pressure boilers) and any boiler used in connection with a non-condensing engine, at less than 180° (for high-pressure boilers). And no marine boilers shall be used without having proper auxiliary appliances for supplying said boilers with water, in addition to the usual mode employed.

[Section 13. Whenever steamers use a pressure upon their boilers exceeding 60 pounds to the square inch, they shall be inspected as high-pressure steamers and designated as such.]

The old British Admiralty specifications for paddle-wheel engines in the navy about 1842 fixed the maximum of speed of the piston as not to exceed 196 feet per minute for a 4-foot stroke, and ranging up to not more than 240 feet per minute for a stroke of 8 feet, these being the velocities that experience showed could not safely be exceeded with the engine as then constructed. When the screw propeller was introduced, worked at a much higher number of revolutions than the old paddle-wheels, it was on this account not at first considered practicable to work the engines at the same speed as the screw so as to directly attach the connecting-rods to the screw shafting, so that, to limit the piston speed to that previously in existence for the paddle engines, spur gearing was adopted and fitted between the crank shaft of the engine and the propeller shaft so as to increase the velocity of the screw shaft. The first of the screw vessels were thus fitted, and the piston speeds and revolutions of the engines in these were much the same as with the preceding paddle engines. This was altered, however, soon after the screw was fitted and it was found that by improvements in workmanship and details of fittings the number of revolutions could be safely increased so as to enable the engine to be attached direct to the screw shaft.

The fifty-first meeting of the American Institute of Mining Engineers is to be held at Birmingham, Ala., beginning Tuesday, May 15. After the sessions at Birmingham the institute will visit Anniston, Ala.

MANUFACTURING.

Iron and Steel.

Laughlins & Co., Limited, of Pittsburgh, proprietors of the Eliza furnaces at that place, inform us that the report recently published that they had closed down their furnaces for repairs is without foundation. The three stacks owned by the firm are all in successful operation, and from present appearances are good for an extended run.

The National Tube Works Company, of McKeesport, Pa., under date of the 19th inst., inform us that the report published in the Pittsburgh papers that they were about to purchase the plant of the Elba Iron and Bolt Company, Limited, at Pittsburgh, is not true. They have no intention of purchasing this or any other works at present.

A. W. Thompson, who has heretofore been secretary of the Etna Iron Works, Limited, of P. L. Kimberly & Co., at New Castle, Pa., whose works have been idle for some time past, has completed arrangements by which he assumes control of the rolling mill department of the plant, which was put into operation on the 19th inst., giving employment to about 500 men. Mr. Thompson has also control of the nail works department, but it has not as yet been started up. The two blast furnaces are still controlled by P. L. Kimberly & Co., and are also idle.

The Scottsdale Iron and Steel Company, Limited, of Scottsdale, Pa., under date of the 19th inst., write us as follows: "Our mills have been closed down temporarily for a few days only. Will probably be in operation again by the 23d inst. We were rushed ahead on our season contracts, and did not care to fill up the time at the present low prices, which is the reason we closed down for a few days."

On account of a slight break in the machinery the works of the Sharon Steel Casting Company, at Sharon, Pa., were closed down for a few days recently, but resumed operations in full Monday, the 16th inst. The report that the shut-down was for an indefinite period is without foundation. The above firm was established less than a year ago, and in that short time have established a reputation for first-class work that compels them to operate their works to their fullest capacity in order to keep pace with the demand for their goods.

The puddlers in the employ of Cooper, Reynolds & Co., at Harrisburg, Pa., are working on a basis of \$3.85 per ton for puddling. There is no trouble at these works, as has been reported.

The Tyrone Iron Company, of Tyrone, Pa., manufacturers of boiler tube, skelp and charcoal blooms, under date of the 17th inst., write us as follows: "We have been idle some time putting in a new 80 horse-power steel tubular boiler, as well as other needed repairs about the mill and switches. We will resume operations again next Monday in all the departments—viz., run-out (or refinery), forge and finishing."

The Montour Iron and Steel Works, at Danville, Pa., which employ about 400 men, have closed down owing to the refusal of the men to accept a 10 per cent. reduction in wages. The price being \$4, the reduction would make it \$3.60 per ton for puddling.

The E. & G. Brooke Iron Company, Limited, of Birdsboro, Pa., have reduced the wages of puddlers from \$3.52 to \$3.25 per ton. The reduction is to go into effect on May 1. The firm, in their notice, stated that the reduction was made necessary because neighboring mills were paying only that figure. The reduction does not affect the nailers.

Charlotte Furnace, owned and operated by the Charlotte Furnace Company, Limited, at Scottsdale, Pa., is still idle, and there are no prospects of it resuming operations for some time.

Swede Furnace, near Bridgeport, Montgomery County, Pa., belonging to the Reading Coal and Iron Company, which has been out of blast for several months, will be started up within a short time. Heckscher & Sons are the lessees.

Executions have been issued against Graff, Bennett & Co., of Pittsburgh, aggregating \$102,608.42. The creditors are Mackintosh, Hemphill & Co., \$967.36; Pittsburgh and Lake Erie Railroad Company, \$12,394.68; Chess, Cook & Co., \$14,727.75; Carnegie Bros. & Co., \$27,122.68; Carnegie, Phipps & Co., \$1,551.46; F. N. Hoffstot & Co., \$34,542.11; J. W. Friend & Co., \$10,548, all of Pittsburgh.

Seaman, Sleeth & Black, proprietors of the Phoenix Roll Works, at Pittsburgh, are engaged in making four of the largest rolls ever made in Pittsburgh. Each roll will weigh 32 tons, be 13 feet long and 51½ inches in diameter. Two weeks' time will be required to finish each roll, and, when done, they will be shipped to the South Chicago Rolling Mill Company. The next two largest rolls were made for the Cambria Iron Company about one year ago, and weighed 24 tons each.

No. 4 furnace of the Crane Iron Company, at Catasauqua, Pa., was blown in week before last, after being thoroughly repaired and relined. Four of the five blast furnaces of the above company are now in operation.

No. 1 blast furnace of the Pennsylvania Steel Company, at Steelton, Pa., which has been idle for some time for repairs, was blown in on the evening of the 18th inst. No. 2 furnace of the above company, which is at present undergoing repairs, will also be ready for blast in a short time.

The Trinidad Rolling Mills and Iron Company have been organized at Trinidad, Col., with a capital stock of \$200,000, shares \$100 each, by Henry Schneider, Harry E. Mulnix, R. B. Holdsworth, F. A. Marriott and Thomas B. Collier. The objects of the company are the manufacture and sale of iron and of all its products, and to acquire and own all the lands, plants, buildings and machinery necessary to carry out the purposes of the corporation; the right to mine coal and own coal lands, manufacture coke, own iron mines and carry on the general business of merchandising. The transactions of the company will be in Trinidad, Las Animas County, Col.

A press dispatch from Findlay, Ohio, under date of the 18th inst., reads as follows: "The Findlay Lagrange Rolling Mill was sold to the Aluminum Product Company, of New York, to-day. The company has a capital stock of \$2,000,000, and proposes to plant \$200,000 of the amount in Findlay."

The Cherokee Iron and Land Company have been organized, at Rusk, Texas, to build, first, a charcoal furnace, and later a coke furnace, at that point.

The charcoal furnace of the Elliot Pig Iron Company, at Round Mountain, Ala., will soon go into blast after being re-modeled.

Machinery.

The Union Foundry and Machine Company, Limited, of Pittsburgh, have recently added to their extensive works the manufacture of machine-molded gearing, including bevel, miter, hunting tooth and spur wheels of all descriptions, and pulleys, band-wheels, sheaves and fly-wheels of any diameter and face.

Contracts have been awarded for furnishing machine tools for the Norfolk Navy

Yard as follows: Niles Tool Works, of Hamilton, Ohio, \$20,800; William Sellers & Co., of Philadelphia, \$11,391; Morgan Engineering Company, of Alliance, Ohio, \$4560; Bement, Miles & Co., of Philadelphia, \$8375; Manning, Maxwell & Moore, New York, \$2450.

The Lloyd-Booth Company, founders and machinists at Youngstown, Ohio, have increased their business within the past year to such an extent that it is necessary to build an addition to their already extensive plant. The building is to be 60 feet wide and 90 feet long. The structure will be two stories high, the first being 22 feet in the clear. It will be furnished with a Yale & Towne traveling crane, with a capacity for 20 tons, and all the machinery put in will be of the finest character. The improvements will cost \$15,000.

The Smith-Hill Foundry and Machine Company have been incorporated at Quincy, Ill., with a capital stock of \$75,000, for the manufacture of engines, boilers, pumps, elevators, &c. The incorporators are Ceylon Smith, Thomas Hill and Pliny B. Williams.

The Heine Safety Boiler Company, of St. Louis, will furnish the Cincinnati Water Works with four boilers of 300 horse-power each, and the Cincinnati Exposition with two of 200 horse-power each. Other recent sales include two boilers of 150 horse-power each to the San José Insane Asylum, at San José, Cal., and one boiler of 175 horse-power to Charles Stern, of Los Angeles, Cal. The firm now have half a dozen large boilers under construction in St. Louis, and 20 to 25 at the East, in Chicago, and on the Pacific Coast.

The directors of the Allentown Steam Heat and Power Company, of Allentown, Pa., consisting of W. F. Mosser, Russel A. Thayer, H. S. Shimer, Reuben Steckel, Dr. H. K. Hartzell, F. A. R. Baldwin and Abel Heilman, have elected the following officers: President, W. F. Mosser; vice-president, R. A. Thayer; secretary, Charles N. Wagner; treasurer, Morris L. Kauffman. The directors entered into a contract with R. S. Bishop, representing the American District Steam Company, of Lockport, N. Y., to introduce the Holly patent. The directors have not yet definitely decided where the plant will be located.

Messrs. Lodge, Davis & Co., Cincinnati, Ohio, have just purchased additional ground and will build at once. When their increased facilities have been completed they will commence the manufacture of several new lines of machine tools. Their present capacity is strained to its fullest extent.

The Boston Heating Company have purchased, recently, 45 Curtis pressure regulators, from ½ to 3 inches in size, to reduce 400 pounds street pressure to from 5 to 80 for heating and power. The larger ones control the pressure on the pumps at the central station.

Mr. Sterling Elliott, of Newton, Mass., has sent us an advance copy of his new machinery catalogue, which, in point of originality, is the most noteworthy specimen of trade literature which has yet come to our notice. Besides illustrating and briefly describing his various manufactures, such as drill presses, centering and cutting-off attachments, pamphlet-stitching machines, bicycles, &c., the catalogue contains a series of full-page comic illustrations, measuring about 7 x 9 inches, purporting to represent the different departments of the works, the shop methods, &c. We cannot, however, undertake to go into details here, and the merits of the catalogue will, moreover, be best appreciated on inspection.

Messrs. Chas. W. Thomas & Co., 786 Broad street, Newark, N. J., have opened

an engineering office at that address, and are in position to prepare designs, tracings, blue prints, specifications and estimates. Mr. Thomas, we may add, was until recently erecting engineer for the Hyatt Pure Water Company, of Newark.

The Metropolitan Electric Service Company, who control the Johnson heat regulating apparatus, have removed their general offices and storerooms to 35 East Fifty-eighth street, New York.

The Square Hole Boring Machine Company, Terre Haute, Ind., inform us that they are fitting up shops with improved machinery for use in the manufacture of their square hole boring machines. They expect to have everything in readiness by May 1.

The Babcock & Wilcox Company, of New York, have compiled the following list of advertisers in *The Iron Age* who are now using their boilers: Phelps, Dodge & Co., Phelps Building, New York City, 80 horse-power; Scoville Mfg. Company, Waterbury, Conn., 500 horse-power; The Trenton Iron Company, Trenton, N. J., 420 horse-power; E. Jenckes Mfg. Company, Pawtucket, R. I., 240 horse-power; The Iowa Barb Wire Company, Allentown, Pa., 624 horse-power; Cambria Iron Company, Johnstown, Pa., 896 horse-power; Old Dominion Iron and Nail Works Company, Richmond, Va., 408 horse-power; Pencoyd Iron Works, Philadelphia, 1824 horse-power; Midvale Steel Company, Philadelphia, 272 horse-power; The Montour Iron and Steel Company, Danville, Pa., 150 horse-power; The Pennsylvania Steel Company, Steelton, Pa., 540 horse-power; The Pennsylvania Steel Company, Sparrows Point, Md., 3840 horse-power; The Troy Steel and Iron Company, Troy, N. Y., 533 horse-power; Gordon, Strobel & Laureau, Philadelphia, Pa., 4390 horse-power; Henry Maurer & Sons, New York, 244 horse-power; Geo. V. Cresson, Philadelphia, Pa., 50 horse-power; Manning, Maxwell & Moore, New York, 717 horse-power; Jos. Dixon Crucible Company, Jersey City, 225 horse-power; E. C. Stearns & Co., Syracuse, N. Y., 50 horse-power; Wheeler, Madden & Clemson Mfg. Company, Middletown, N. Y., 244 horse-power; Port Chester Bolt and Nut Company, Port Chester, N. Y., 50 horse-power; Pittsburgh Steel Castings Company, Pittsburgh, Pa., 416 horse-power.

Hardware.

The Southern Horse Nail Company, Decatur, Ala., are about commencing work on their factory.

The extensive Curtis Saw Works, in St. Louis, including valuable patterns, were destroyed by fire the 18th inst.; loss \$50,000.

The factory of the Grand Rapids Refrigerator Company, Grand Rapids, Mich., is located on Ottawa street. The building is six stories and basement, 66 x 130 feet, and is substantially built of brick and stone. It is well lighted on three sides, and has modern appliances for the prevention of fires. The floors of hard wood are doubly packed with asbestos, and automatic sprinklers are in different parts of the building. The stairways have automatic hatchways held open by a device composed of fusible metal, and the elevator well is fireproof. Power is furnished by a Corliss engine of 180 horse-power. The machinery is the most improved, and every convenience is provided for handling the material and finished work economically. The company can turn out 100 refrigerators a day, and are now running full. They allude to their works as the largest and most complete in the country.

The Spears Axle Company, recently formed at Wheeling, W. Va., announce to the trade that their works are rapidly ap-

proaching completion and that they will be ready to commence operations by May 15 next. The company will manufacture a full line of carriage and wagon axles.

R. E. Dietz & Co. have removed to the large and commodious building located at 429, 431 and 433 Greenwich street, near Lighthouse, where with modern improvements, largely increased facilities and ample storage room, they will be able to meet promptly the demand for their tubular lanterns.

E. T. Barnum, Detroit, Mich., has just completed his new works. The present factory is located at 715, 717 and 719 Grand River avenue, and is referred to as exceptionally complete and convenient, being thoroughly equipped with new and improved machinery, thus putting him in a position to supply the trade with the line of goods of which he has long been a prominent manufacturer.

Miscellaneous.

On Saturday, the 21st inst., the Ohio Tin Plate and Copper Company, of Bellaire, Ohio, signed a contract to move and locate their works in Findlay, Ohio. The capital stock of the company is \$40,000, and they give employment to 50 men.

The Reading Coal and Iron Company are now mining more coal than they ever did. They are running full time, and the Lehigh Valley Company are also keeping up to their standard capacity, while the coal companies operating in the Wyoming region are working on three-quarter time. It has been estimated by the Reading officials that in 14 weeks they will have entirely recovered the ground lost by reason of the recent labor troubles. There is no doubt that some sort of an arrangement has been made by the coal companies, under the terms of which consumers are to be forced to bear the burden of losses incurred through the strikes in the Schuylkill and Lehigh regions.—*Philadelphia Record*.

The Post Steel Tubular Company will build works at Northeast Minneapolis. The works will consist of a main building 450 x 60, with wings on each end 500 x 50. Between the two wings will be located other buildings, including the engine house, which will supply power to the entire plant. It is estimated that \$250,000 will be required to erect the works.

Licenses of incorporation under the laws of Illinois have been granted to the following companies: The International Perpetual Exposition Company, Chicago; capital, \$500,000; for the organization and maintenance in the city of Chicago of a perpetual exposition: incorporators, Joseph R. Wickersham, Charles L. Currier, Simon Florsheim and Joseph M. Bailey. The Western Siemens-Lungren Company, Chicago; capital, \$7500; for the manufacture of illuminating lamps and fixtures; incorporators, Junius Schweizer, B. A. Smith and A. Gillespie. Park Manor Light and Heat Company, Chicago; capital, \$500,000; for the manufacture and sale of heat and light; incorporators, T. P. Keefe, David Quigg, C. R. Corwith and L. D. Hammond. The Colby Testing Machine Company, Chicago; capital, \$50,000; for the manufacture of a testing machine; incorporators, Richard G. Colby, David Hogg and Alexander T. Hannah.

The Woodward Iron Company, of Woodward, Ala., write us: "After worrying along for months with one of Fayette Brown's automatic incline hoists we confess to having made a big mistake in putting it in on our No. 2 furnace, and are replacing it with a vertical cast-iron column hoist which is being made in our own foundry and machine shops. One of the defects of the Brown hoist is the irregularity of its distribution of stock in the fur-

nace. We tried every way we could think of to remedy this radical defect, but could not overcome it, and as stated we thought best to acknowledge our mistake and put in another hoist."

Steel in Marine Engines and Boilers.

One noteworthy feature in the development of the modern marine engine, says the *London Engineer*, is the gradual extension of the use of steel instead of iron as the material of construction. In the boilers, which were, of course, made for many years entirely of iron, steel found its first application in the shells, and shortly after its use extended to all the external parts, leaving only the internal parts of iron. Now, however, the material has been much improved in manufacture, and has proved so trustworthy that usually the whole of the boilers, without any exception, are made of mild steel. The only part for which iron is still sometimes used is for the boiler tubes. The last few years, too, have marked a remarkable extension in the use of steel for the engines, by which means the considerable reduction of weight which has taken place has been much assisted. In the hollow form for crank and other shafting transmitting torsion it has been used for some years, and also in the navy for cylinder liners; but now, however, that plates of mild steel and castings of steel can be obtained at a reasonable cost, and of dimensions and weights such as a few years ago were impossible except at prohibitive prices, the material is used to a very large extent indeed, such parts as pistons, framing, pillars, standards, cylinder covers and rods generally being now almost invariably made of it. Gun metal, too, has for many purposes largely displaced cast iron. These changes, coupled with a correct proportioning of the parts to the strains coming on them, and the machining of many parts of the engines which have hitherto usually been used in the condition of receipt from the foundry, have no doubt added to the cost of the engine, but have aided materially in producing the present light-weight machinery. The following results—obtained by taking a few standard and representative examples of the types which have been fitted in the navy at various periods—will show the progress which has been made in the direction of reducing the weight of mechanism.

Taking the first of the naval engines, we find the paddle-wheel vessel *Salamander*, tried in 1832, with a steam pressure of 4 pounds per square inch. Her machinery weighed 1540 pounds per indicated horse-power. As to how this amount was divided no information is available. During the succeeding 13 years the weight was reduced very considerably, until in 1845 we find the paddle-wheel vessel *Terrible* with a steam pressure increased to 9 pounds per square inch. In this case the weight of engines was 428 pounds; boilers and water, 274 pounds, or a total of 702 pounds per indicated horse-power. Improvements subsequently took place, principally in the engines, as their design became better understood, and in 1850, when the paddle-wheel vessel *Magicienne* was tried, the pressure of steam had been increased to 14 pounds per square inch, and the weight of engines had been substantially reduced, and were only 264 pounds per indicated horse-power, while the boilers had increased slightly to 286 pounds per indicated horse-power, owing to the increase of steam pressure, the total weight being 550 pounds per indicated horse-power. In each of these cases the number of revolutions of the engines was from 15 to 20—the usual speeds for paddle engines.

THE WEEK.

The present low rates for ocean freight are the subject of serious complaint by agents of foreign steamship lines, it being impossible in many instances to obtain a cargo sufficient even for ballast purposes. This results from two causes: One, that so many steamers are bringing emigrants that they are in competition for outward bound freight; and secondly, wheat and corn are held too high for export since the recent speculative advance. Flour and cotton are stopped also by the glutted state of the foreign market. Meanwhile, according to London cables, at least 100 vessels have been chartered on the other side to bring wheat from Russia and Danubian ports, mostly since the large advance in prices in this market. Fears are expressed, therefore, that the depressed condition of the export trade and freight market will continue for a considerable period.

The agent of an American manufacturer just returned from a six-months' tour in the United Kingdom, after visiting some 30 fairs and country exhibitions, brings accounts of brightening trade in every department, in gratifying contrast with the dullness prevailing at the close of last year.

E. H. Botsford, late secretary of the coke syndicate at Pittsburgh, has accepted a position as traveling agent for the Connellsville Coke and Iron Company of that city.

On Saturday, the 21st inst., P. H. Miller, assignee of Graff, Bennett & Co., at Pittsburgh, filed a petition in court asking leave to resign the position because some of the creditors are dissatisfied with him.

Edward Roberts, who has been connected for 21 years past with P. L. Kimberly & Co., at Sharon, Pa., will, on May 1, assume the management of the plant of the Youngstown Rolling Mill Company, at Youngstown, Ohio.

The Brazilian Ministry will attempt the entire abolition of slavery during the present year.

The copper mines in Montana are said to be flourishing since the recent advance, which enables them to derive a handsome profit above freight charges, which before placed them at a great disadvantage compared with mines nearer the Eastern market. The principal copper mines are at Butte City and Anaconda. The smelting works at Anaconda are reported to be turning out 400 tons of copper daily.

Hundreds of tons of wrecked steamboat machinery are accumulated at St. Louis, filling four large warehouses. The estimated value at 20 cents on the dollar of original cost is \$300,000 or over. In every direction, piled high in buildings and yards, are boilers, bells, steam gauges, whistles, bellows, shafts, stirrups, pumps, hog chains, safes, anchors, &c. Separate parts of the machinery of 30 or 40 vessels may be seen together, most of which were bought at sales by United States marshal or underwriters' sales. It is calculated that with the exception of the boilers the machinery will, if well taken care of, wear out six boats, hence it is transferred from one hull to another, and of all the steamers built as many almost have some piece of second or sixth-hand material as have entirely new.

Garbage burning in Chicago is quite successful save in point of economy. There are two furnaces, so constructed that teams are driven directly on the flat roof, whence the garbage is dumped through shutters running to the floor below. These furnaces are burning about 50 tons

of garbage a day, or less than half their capacity. The fuel required, according to some estimates, would be 4 tons of soft coal a day, but some kinds of garbage, such as spoiled vegetables, will require nearly double this quantity. With the exception mentioned, as stated at the Health Commissioner's office, the works are perfectly satisfactory. It is seldom that any offensive odor is emitted from the smokestack.

Lake navigation will open this year much later than in 1887, as the ice in the Straits of Mackinaw will resist the most favorable kind of weather for weeks. It seems unlikely that vessels can reach the lower lakes from Lake Michigan before May 1, and it is usually later when the St. Mary's River and Canal open than when the ice in the Straits breaks up.

Deplorable accounts, apparently authentic, come from Havana respecting the condition of lawlessness prevailing throughout the island, attended with robbery and assassination, demoralization in the post office and squandering of public funds. Letters in the post office, it is asserted, are immediately destroyed if inimical to the Government, and custom house receipts show a deficiency increasing from \$100,000 in October to \$207,000 in December. At the same time Captain-General Marin insists that the custom house is honestly managed. In proof of the desperate condition of affairs the names of five business men are given who were kidnapped within the past month, and the wealthy planter Golindez, of Adalma, was obliged to pay \$17,000. The latest advices seem to confirm the report that martial law has been proclaimed in the four provinces of Pinar, Del Rio, Havana and Villa Clara.

A small brass statue was discovered recently near the Acropolis Museum, Athens. It is in a perfect state of preservation, and the figure bears a close resemblance to the Apollo of Canachos in the British Museum. This statue is the best specimen of workmanship in brass that has yet come to light in the course of the excavations at the Acropolis.

The work of constructing a \$1,000,000 bridge across the Thames River, at New London, has commenced. The draw will be 500 feet in width, giving a channel way of 225 feet on each side of the central pier.

The first run of Dakota tin was put through the new smelting process at Rapid City successfully, and plans for the erection of large works for treating tin are in course of execution. Professor Emmons is looking up machinery.

An Ontario dispatch says the Dominion Government is pledged to establish an Atlantic mail service fully up to the standard requirements as to speed.

The citizens of Montreal were favored on Saturday with seeing in operation for the first time two huge pumps and four engines designed to prevent inundations during the season of high water in the St. Lawrence River by relieving the sewers of their surplus. The works have a capacity of 72,000 gallons, and are arranged with an underground flume, gates and discharge flue. Two engines are sufficient for all demands, except as reserve power is wanted in case of accident to machinery.

Secretary Whitney has written a letter of instructions in regard to the projected construction at the New York Navy Yard of an armored cruiser to be known as the Maine, provided for by an act approved August 3, 1886. The limit of cost, excluding armament, is \$2,500,000. The Secretary says the construction of this vessel will be the first important new work undertaken at an American navy yard in 15 years. The William Cramp & Sons Ship

and Engine Building Company have nearly completed a dynamite cruiser gunboat called the Yorktown, designed for the United States Navy. It will be launched on Saturday, April 28th. It carries four pneumatic guns for the hurling of dynamite projectiles, each with a range of at least a mile. The training of the guns is accomplished by steering the vessel, and the loading is all done by steam. The guns are of 15-inch caliber, and the shells, which can be fired with great accuracy twice a minute, will contain 600 pounds of explosive gelatine, equivalent to 852 pounds of dynamite, or 943 pounds of gun cotton. It is claimed that this gun, properly handled, will be the most destructive engine of war yet invented. Work on the new steel cruisers Chicago and Boston, at the New York Navy Yard, is to be pushed forward as rapidly as possible.

A stove in a Brooklyn restaurant exploded last Friday, with fatal results, the cook being killed by the flying fragments. The stove was of the old-fashioned double shell variety. The space between the inner and the outer shell of the stove was filled with water supplied from a cold-water pipe, which, after it became heated, passed off into a boiler. The stop-cocks of both the supply-pipe and the escape-pipe, it seems, were turned off when Charles Raynor, the cook, lighted the fire, and in a few minutes the water in the shell began to boil. There was no way for the steam thus generated to escape and an explosion occurred.

Only a few years ago Mexico's only railway was that from Vera Cruz to the capital—263 miles—and controlled by English capital. There are now built and in operation:

| | Miles. |
|---|--------|
| Metamoras and Monterey (Mexican National concession)..... | 75 |
| Laredo to Saltillo (Northern Division Mexican National)..... | 285 |
| San Miguel to Mexico (Southern Division)..... | 409 |
| Morelia Division..... | 96 |
| El Salto Branch..... | 50 |
| Mexican International, Huntington Southern Pacific line, Eagle Pass to Lerdo, on Mexican Centr. l. about..... | 350 |
| Mexican Central, El Paso to Mexico..... | 1,224 |
| Sonora Railway Company, Limited, Nogales to Guaymas..... | 265 |

Not counting the 400 miles of the National, now building, and the money for which has been secured, there are now in Mexico over 3100 miles of railway. Of these all but about 350 miles have been built by American companies. About 1000 miles of these American roads are narrow gauge. If we compute these 2750 miles of standard and narrow gauge lines at \$30,000 per mile the money thus invested by Americans in railways in Mexico within the last few years is shown to exceed \$80,000,000. None of these lines are as yet very profitable, but they are steadily gaining.

The Rutland County, Vermont, Court of Chancery has ordered the Howe Scale Works to be sold by auction at the office in Rutland before July 1 to satisfy the mortgage held by the National Bank of Rutland to secure its debt, amounting to \$376,554. The total debts secured by mortgage amount to \$458,455.

At Allentown, Pa., Fisher's pipe foundry was shut down on Saturday indefinitely, owing to the dullness of trade, the uncertainty of the future, and the unsatisfactory work done by the employees.

The granite cutters of Boston, after a lockout lasting one year to enforce an attempted reduction of wages, but without success, have declared it at an end.

The Minneapolis flouring mills are turning out larger quantities of flour than ever before. The product of March, added to that of the 52 outside mills, made an aggregate product of 931,352 barrels, against 834,215 barrels for the same month in 1887.

Richmond, Va., is rapidly improving. Capital is being invested extensively in new manufactures, and the flouring mills, with improved machinery, will have a capacity for 6000 barrels of flour per day.

Proposals for Indian supplies now invited in this city by the Interior Department comprise hardware, plows and other farming implements, 250 wagons, &c.

Over 5000 emigrants arrived at this port in one day last week, a record unprecedented in the history of New York.

There are now four steamship lines in the merchant service between Marseilles and South American ports, two lines having been added recently. They are of iron and from 2000 to 2800 tons register. Their chief dependence is the Italian emigrant trade, supplemented by the freight traffic from Marseilles.

Spain must be credited with being the first nation to make it, by absolute legislation, obligatory on managers of theaters in Madrid to light those buildings by electricity, to the total exclusion of gas. Six months are allowed in which to carry out this most important reform. All dynamos, engines, and motors of any kind are to be completely isolated from the main building, and minute rules are laid down for their safe installation. The supplementary lights are to be oil lamps. Persons employed behind the scenes are prohibited from using unprotected lights.

Nova Scotians who flock into Boston during the fishing season are said by a Government official at that port to underbid the American laborer in manning vessels, and yet there is no way of excluding them under the contract labor law. "The result," says the authority here quoted, "is to be deplored in more senses than one. In addition to their driving the native seaman into occupations for which he is ill equipped, they rob the country of thousands of dollars and leave nothing in return. They bring here their pauper labor, and leave poverty and misery. In addition, they have so unsettled the market with their low-priced services that there is a constant backing and filling among the trade as to prices. If an owner is enabled to employ a crew 50 per cent. cheaper than his competitor, he can sell his catch so much less than the owner who has sailed with an American crew. In the regulation of prices there must either be a great loss to the vessel employing home labor or an enormous profit to the one with the foreign crew. No matter in what light you view this question, there is no phase of it that does not show injury to the American fisherman." In Portland, on the contrary, it is alleged that the presence of Nova Scotia fishermen is very clearly an advantage rather than a detriment.

The railway pool at Castle Garden has been smashed and immigrants are eagerly provided with tickets to Chicago by the rival companies for about \$10 each.

The Koninklijke West Indische Maildienst (Royal Dutch West India Mail Service), a company started some years ago under contract with the Netherlands Government for the conveyance of the mails from Amsterdam to Surinam, have decided to extend their service to this city, and their steamers, instead of returning from South America to Amsterdam, will now leave the port of Paramaribo, in Surinam, via Demerara, Trinidad, Carupano and other ports in the West Indies, to New York, arriving here on the 25th of each month; leaving New York on the 1st of each month; they will call at Port au Prince (Hayti), Curaçoa, Porto Cabello, Carupano, Trinidad, Demerara and other West Indian ports, arriving on the 23d of each month at Paramaribo, in Surinam, from which port the steamers will then leave for Am-

sterdam. This line will thus offer a much desired opportunity of extending our business relations with ports of South America.

A number of short lines of railway will be built in Oregon by the Oregon Railway and Navigation Company to meet the increasing demands of trade on the Pacific coast.

The export of Russian petroleum to India is assuming the dimensions of a considerable industry. Accounts just received in England show that the shipments for the past year were 908,543 casks.

A call was issued on Saturday for a national convention of manufacturers, to meet in Des Moines, Iowa, May 15, 16, 17 and 18. The invitation is extended to manufacturers of the Northwestern and Eastern States to discuss matters of general industrial interest.

The report of the Montreal Harbor Commissioners shows that the tonnage of that port for last year was 1,662,225, an increase of 61,074 tons over 1886.

A New York syndicate have paid \$1,148,000 for a tract of land near St. Louis, which they propose to connect with the city by an elevated railroad and develop an important suburb.

The brickyards on the Hudson River have started up for the season, but trade is not active.

William B. Dinsmore, the well-known president of Adams Express Company, died in his residence in New York, 20th inst., from an affection of the liver. He has been identified with the express interests of the country since 1841, when Alvin Adams, Mr. Dinsmore and John Hoey established the business of that now enormous institution. Beginning with a leather bag and a hand-barrow, to-day they have 8000 employees in their service.

Lake papers give the names of a large fleet of vessels which have been taken out of the ore carrying business to engage in the lumber trade.

The largest wine cellar in California is being built near St. Helena, Napa County, by Bourne & Wise. It is to be a three-story building, 400 x 85 feet. The two lower floors will have storage capacity for 600,000 gallons, while the upper floors will be used as a winery. It will be of stone, and will cost \$350,000.

The Southern Pacific Company have ordered plans for three steel colliers, larger than any now on the Pacific coast, to cost \$500,000 each.

Omaha, in Nebraska, is among the rising cities in the great West. One of the most substantial proofs of Omaha's growth is furnished by the exhibit of public improvements and by her beautiful residences and business structures. About \$13,000,000 was expended last year in public improvements, in addition to \$7,000,000 in 1886. In 1887 about 2600 buildings were erected. It has been hardly possible to build houses, hotels and offices fast enough to accommodate the new comers. In 1880 the population was 30,500. Since then her population doubled every five years. Last year the real-estate sales were double those of the year before, and amounted to \$31,000,000, against \$6,000,000 in 1885. Omaha now aspires to become the great pork and beef packing center, as against Chicago. During the year 1887 there were 823,208 hogs killed there, weighing 206,772,298 pounds, the cost of which was \$9,894,785.30. The cattle killed in the same time numbered 65,752, their weight being 81,305,490 pounds, and the cost \$423,701. The figures, it is predicted, will be doubled in 1888.

The Egyptian cotton crop promises to be unusually large this year.

The late United States Consul at Jerusalem, N. T. Arbeeley, in co-operation with the United States Consul at Beyrout and John H. Caldwell, United States Consul-General at Cairo, are exerting themselves in favor of the establishment of direct steamship communication between this country and the East, confident that the result would be a large and profitable development of Syrian and Turkish trade. Mr. Arbeeley says his pet project is the fostering of commercial relations between the United States and Egypt and Turkey. The principal products in the East are wool, licorice root and silk. Each year there is probably imported to this country not less than \$2,500,000 worth of wool, about \$1,500,000 worth of licorice root and certainly \$5,000,000 or \$6,000,000 worth of curiosities, fruit and other Syrian merchandise. Altogether it is safe to say that at least \$10,000,000 of products are imported. But these goods reach America via Liverpool, at a largely increased cost, on account of extra handling and custom dues. Take the case of our exports. Formerly American petroleum found a ready sale in Turkey and Egypt, and though the discovery of oil at Batoum has hurt its sale somewhat, still the people like it and would readily purchase it if it were steadily in the market. It is the same with other exports, as is proved by the fact that not less than \$15,000,000 worth was consumed last year. Americans get silk from Teheran by way of Liverpool, but if steamers run between here and the East they could get silk from Syria at far less cost. Steamers starting from American ports could touch at points in Spain and the Levant, and then go on by way of Constantinople and Smyrna to Beyrout, and return by way of Port Said, Alexandria and Northern Africa, or they could touch at Marseilles and then come straight home. Mr. Caldwell has satisfied himself that American merchants neglect their best interests if they fail to immediately establish direct communication between this country and the East. Ex-Consul Arbeeley intends to remain in this city for some time, in the hope that he may be able to impress some prominent merchants with the feasibility of his project.

The Huntington line of American steamers, to run between Liverpool and Newport News, proved unprofitable and has been discontinued.

Gen. H. S. Sanford, who has taken an active part in securing the recognition of the Free State of Congo, speaks with enthusiasm of trade prospects in that part of Africa and the opportunity there offered for American enterprise. He says: "In regard to the Congo, it is the most wonderful system of waterway on the face of the globe. It has twice the extent of navigable waters of the Mississippi and its tributaries, three times its population, 'thirsting for trade,' to use Stanley's expression. Professor Du Pont, who has just returned from there, after six months of exploration of its lower waters, told me that its fertile valleys were destined to become the granary of the world. India rubber, gums, ivory, dye stuffs, silver, lead, iron, coffee and palm oil are there in immense quantities awaiting exchange for the cotton stuffs which we can furnish." The Arabian trader has already established himself there in force, and "his progress is marked by the introduction of commerce, slave raiding Islamism and unbleached domestic cottons."

A petition to the Legislature from the New York commercial exchanges for increased dock facilities in this city says that for 2½ miles on the North River front only two bulkheads are open to the public, nearly all having been leased to private parties, severely hampering the commerce of the port.

The Iron Age

New York, Thursday, April 26, 1888.

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JOHN S. KING, - - - BUSINESS MANAGER.

The opinion is once more gaining ground that during the present session of Congress no material changes in the tariff are to be expected. This is largely based on the fact that public business needing consideration above all other matters is in a woefully backward state so far as the action of Congress is concerned. The appropriation bills have not been acted upon with the exception of a single measure, which usually does not call for more than an hour's consideration. The general tariff debate has begun, but it is understood that upward of 100 members of the House are to speak, so that it will take considerable time before the real work, the discussion and the modification of the Mills bill item by item, can begin. Some of the large newspapers which have sought every means to aid and push the passage of the measure proposed by the majority of the Ways and Means Committee have ceased to proclaim their conviction that it has good chances to become a law. It would be dangerous to let possibly unwarranted confidence weaken the vigorous opposition of those who believe the Mills bill to be vicious, inconsistent and disastrous to great interests. Yet it is important, in order to restore the confidence which is so generally lacking in the immediate future, that business men should appreciate the fact that the outlook in tariff matters is at the present time more favorable than it has been.

Shifting Currents of Trade.

The American business man whose experience extends merely over two decades has observed in that short time remarkable changes in the business of the several sections. The development of the resources of the country has proceeded so rapidly, transportation facilities have so multiplied and new centers of population have sprung up so quickly that the currents of trade have shifted from their old channels, and sharp management is needed to follow them without shipwreck. In point of fact wrecks have marked the course of business in recent years which can be pretty plainly traced to new trade influences rather than to faulty management or reckless pushing forward. The growth of the manufacturing West is an old tale to the enterprising people of New England, who point to dismantled works in many of their bustling towns whose once prosperous owners were obliged to succumb to an overwhelming competition which in many instances was very suddenly developed. The owners of some threatened establishments took warning from the fate of their neighbors, removed to localities presenting special advantages, and are now operating in the West works which are the lineal descendants of old-time New England factories. In the same way the manufacturers of foundry pig iron in Eastern New

York, after years of prosperity and the apparent establishment of their business on a most solid foundation, ultimately discovered the ground under them being cut away by competition from Pennsylvania and the West, over transportation lines which had made such competition not only possible, but had practically invited it.

The process is continuing and will continue for an indefinite time, probably until this country becomes thickly settled in every part capable of sustaining population, and its resources are all definitely comprehended, and its transportation system has brought every locality into ready communication with the great arteries of trade. The iron manufacturers of Eastern Pennsylvania are finding it necessary to again practice the most rigid economy to meet the competition of Southern iron-makers who were able to seize a good slice of their trade in 1883 to 1885, and are making a more formidable demonstration this year, with a threatened heavy increase in their productive capacity in the near future. Even Pittsburgh, hitherto deemed in possession of an impregnable position on the western slope of the Alleghenies, with the whole Mississippi Valley from which to demand tribute, and a wealth of resources beyond the dream of a sorcerer, cries out at the encroachments of Chicago, which has long been in the field as an iron and steel center, but now looms up as a point of cheap production and thus becomes formidable.

It is a rude awakening to a manufacturer or a merchant who has long believed himself supreme in a certain strip of territory to find an active competitor in the same line suddenly established in its commercial center, invited thither by the opportunities created through improved transportation facilities, increased population, or the discovery of some favoring natural condition. There is then an end to the establishment of a fixed price "at mill," plus freight, to be paid by the purchaser to his distant purveyor. A competitive price is speedily established; and, in time, if several similar enterprises group themselves around this nucleus, the former trade ruler of this domain probably finds his immediate home market invaded. The introduction of new and improved processes, the invention of more efficient labor-saving machinery, and the substitution of superior material, may often overcome natural disadvantages in situation and enable establishments to maintain their hold on their customers with even an increased grip. But this is not the case with a whole group of industries, or a whole line of staple goods or materials. There are localities in the West which but a few years since were prominent points for the shipment of old material which had been collected in the neighborhood, and was sent thence to other points further east to be worked up, but now there are industries in active operation which not only absorb the local supply but take large quantities from remote districts. In this respect, as in the case of finished products, the time is passing when values are regulated by the price at an established trade center, plus the freight or minus the freight, according to the direction of shipment. Yet this change proceeds without confusion, it does not result in chaos, and the business of the country grows enormously.

The Position of Tin.

The influence which the speculation in tin by the French syndicate, inaugurated a year ago, has exercised on its consumption in Europe and America has been most disastrous. The extraordinary rise in the metal took place during the last few months of last year, and it appears that during the first six months after the improvement commenced general consumption fell off some 20 per cent., and has been increasing but little since then. It appears that in a good many industries formerly using tin other materials have been substituted for it, and the supposition is that they have answered the purpose, so that some time may elapse before they will return to tin. Meanwhile, wherever this was possible, a great impulse has been given to production. In the Straits Settlements in particular this has been the case, so much so that while, as we have stated, consumption fell off some 20 per cent., shipments from the Straits increased 80 per cent. The influences alluded to continuing more or less unabated during the last few months, the result has been that April opened with a visible supply, in Europe and America, of 22,894 tons, as compared with 11,095 on April 1, 1887, the price being £166, against £102 then. At the same time three months tin has been selling in the London market £50 below the spot price, showing that most people in the trade and the majority of speculators expected a considerable break in the near future. This expectation of a considerable decline may, however, have led to an enormous speculative overselling of the market, and may therefore expose those operating for a decline to an occasional corner, such as the metal is situated. We must not lose sight of the fact that both dealers and consumers have been all along buying from hand to mouth and hold as light supplies as possible; that consequently they are occasionally forced into the market and have to subscribe to the extreme spot price which the syndicate may dictate. That the latter has at its disposal not only almost unlimited means, but is managed by a man who combines great business capacity and shrewdness with perseverance of no ordinary kind, is now sufficiently known. The game may, therefore, continue for some time longer and prepare losses for those who steer counter to it too early. One of the metal papers on the other side hints that the accumulation of the visible supply may, to a considerable extent, have increased latterly by drawing on the reserves that were held by producers and speculators, in consequence of the high price prevailing; that therefore people may in a measure be mistaken if they conclude that the swelling of supplies is almost exclusively due to increased production even in the Straits Settlements and Australia. As for Banca and Billiton, it is at the same time impossible to form a correct opinion as to the capability of those Government mines managed and controlled by the Netherland Trading Society to give much impulse to the output in that part of the East. Billiton, we are aware, has been gradually increasing its production for a couple of years past at the prices then prevailing, moderate though they were. Whether this is also possible in the Island of Banca few people not

familiar with those mines are in a position to judge. Nor are the outsiders acquainted with the policy which the said society may be inclined to follow under the circumstances as regards the management of the unsold tin which they have on hand or will have on hand during the remainder of the year. If the syndicate has been able to get the control of copper production for years to come to an enormous extent by separate contracts with mining companies, this cannot be done in the case of tin in any of the producing countries that we know of. This is one of the weakest points in the position of the syndicate so far as tin is concerned, while it is one of the strongest in its relation to copper. Dependent as the future course of tin prices thus is from a purely commercial point upon a great many contingencies, it seems by no means so very easy to foresee or demonstrate that the metal is bound to cave in at short notice, and caution in handling it seems all the more commendable if speculators or the trade wish to prevent being caught by a surprise.

Aside from purely commercial considerations, there are, of course, the usual contingencies of a financial or political nature that may arise, beyond the control of even the strongest syndicate. Although for the moment the general aspect of political affairs in Europe appears peaceful enough, events may happen any day which are liable to precipitate the general war. To what extent it would affect the stock exchanges and money markets on the other side, as well as commodities not in urgent demand by the belligerents, the experience of great and unforeseen events of the kind has taught us frequently enough during the past 40 years. The possibility of any such happenings is another weak point in the tin situation in Europe. It appears evident that the immediate future of tin values is extremely doubtful, and that it would be daring too much to count with any degree of certainty upon the course of prices in either direction.

Lower Costs in Pig Iron.

Last year it was the cause for much just complaint on the part of pig-iron manufacturers in that territory west of the Allegheny Mountains dependent chiefly on Connellsville coke and Lake ores that the higher cost of raw materials and advances in freights had more than kept pace with higher selling prices of iron. During the past five or six months there has been a constant struggle to lower costs in proportion to the heavy and rapid decline in values. Now at last relief has come from different quarters. Coke has gone below the dollar line, and the freights on the fuel have been reduced, 10 per cent. in all, bringing them back to where they were a year since. We print the figures elsewhere.

The long period of uncertainty concerning this season's prices for Lake ores has at last come to an end. Month after month passed by without any announcement of sales, except a few scattering lots. There was a protracted struggle between the mines and the vessel owners, until at last season charters were closed on the basis of \$1.25 from Ashland to Cleveland.

A number of the leading companies of the different Lake Superior districts have named prices, and a series of sales are reported to have taken place during the past five or six days. In the Gogebic district the Norrie mine is stated to have placed 150,000 tons with the North Chicago Rolling Mill Company, who are understood to have an interest in the property. The price is given as \$3 on cars at mine, equivalent to a shade over \$5 at Cleveland. The Republic has announced \$6 as the figure for specular Bessemer ores, having sold a considerable tonnage. The Minnesota has named \$5.75 and the Chapin \$5. Sales are reported by a number of other leading mines. After some show of opposition and a number of local strikes, generally of short duration, wages at the blast furnaces have been lowered about 10 per cent. on an average.

Thus along the whole line there has been a readjustment of the conditions affecting that part of the iron trade which is the foundation for so many and such varied industries. It is probable that, in anticipation of this lowering of cost, a good many furnacemen have entered into contracts for the delivery of metal for the future. The statement has been reiterated, and is no doubt true, that on the basis of old prices for raw material and rates of freight the quotations for pig have been closely crowding cost. It is argued, therefore, that buyers have no reason to expect any material further reduction in prices, since the readjustment alluded to in reality places pig manufacturers in the section affected upon a sounder basis. They had been placed in the position of being forced to face a market declining rapidly as the result of smaller consumption, while every item entering into cost was holding tenaciously at the level which it had reached under the stimulus of an unprecedented volume of business. The developments of the next few weeks must prove whether or not there is room for any lowering of prices without so much curtailing the output as to cause undue restriction. For the present there seems to be no chance for any further decline in the cost of fuel, nor is it likely that any more concessions will be made in rail freights. The only doubtful point is whether the opening prices for ores will be final.

Gradually the details of the negotiation between the leading copper producers and the French syndicate are coming out through the proceedings of public meetings of shareholders. The last reported is the Cape Copper Company, whose directors appear to have driven quite a sharp bargain. They have contracted to sell to the Société des Métaux 5750 tons of best selected copper annually for three years, at £70, and have given an option for an extension of the contract for a like period. If they exceed that output, they are paid only the price which they were getting before the boom. They agree, furthermore, to smelt for the syndicate the product of the Quebrada mines, in Venezuela, and the Namaqua Copper Company, of the Cape, and retain the right to handle the Tilt Cove ores, of Canada. They must not work any other ores or furnace material. The contract is guaranteed for one year by the Comptoir d'Escompte, of Paris, which, as the chairman of the Cape Copper Company puts it, has

a subscribed capital of \$15,000,000. Apparently they are to fall back on the guarantee of the Société des Métaux for the other two years' sales. The directors succeeded in introducing into the contract a clause whereby they can sell their brands of best selected to their own customers, but for and on account of the syndicate, who pay them a small commission. They are thus protected against the danger of losing their identity as producers, a provision the neglect of which some of the Lake Superior companies had occasion to keenly regret under the old pool export sales. The directors of the Cape Copper Company are naturally jubilant. They figure out that under the contract they can make a snug little profit of £220,000 to £230,000 per annum on a capital originally paid in of £160,000, which, by the way, has been repaid to the shareholders many times over again, the concern having distributed dividends aggregating £1,380,000. They have accumulated reserve and guarantee funds amounting to nearly £300,000, and propose now to enlarge the capital to £600,000, the pretext being that its present charter does not allow the company to carry on certain smelting operations which they have engaged to do. While it is true that the Cape Copper Company has always been an exceptionally prosperous concern, it is reasonable to expect that its enormous profits under present high prices, and those of other copper mines all over the world, will stimulate the promotion of enterprises of a similar character in all countries. With the lowering of interest so clearly proven by the Goschen refunding success, ventures promising relatively enormous returns will prove tempting to investors and speculators. We know that the London market is being well supplied with copper-mining schemes, among them one very large proposition from Mexico. No aggregation of capital, however large, can for an indefinite period stand out against an increase in the supply which cornering prices invites.

The Burlington's Report on the Interstate Law.

In the popular belief the Interstate Commerce law has been a great help to the railroads, and it is generally thought that a reasonable part of the prosperity which our railroads have enjoyed for a year should be ascribed to this cause. So much is this true, that we have occasionally heard it charged that the railroad managers secretly favored the bill while outwardly opposing it, knowing that features like the section compelling adherence to published rates would enable the roads to earn a larger revenue. Some surprise was created, therefore, by the statement in the report of the Pennsylvania Railroad that the good effects of the law are doubtful. The annual report of the Chicago, Burlington and Quincy also has some remarks upon the law, disapproving it, although that company were glad enough to seek its aid during their strike when their connections refused to handle their cars. After lamenting a general decline in freight rates late in 1887, whose effect will be more seriously felt in the earnings for 1888, the report says: "This is largely due to the absence of any means of self-regulation among the railroads, because of the prohibition of pooling by the Inter-

state law. The law attempts to check the effect of prohibiting pools by the long and short haul provision; unfortunately the check amounts to but little, because there is always some one competitor with little local business, who has the power to fix through rates for all, and hence to force the lines with a valuable local traffic either to go out of the through traffic or reduce local rates to the level of the through rates. But in such cases there is really no choice, for the reason that the so-called local business is, in fact, carried on in competition with similar business at strictly competing points; and to attempt to maintain local rates by refusing to meet rates from competing places, is simply to drive business away from the so-called local stations."

Those of our readers who may be engaged in manufacturing or shipping from strictly non-competitive and local stations will be interested in the sentence last quoted. It is perfectly true, and the wonder is that so many of our railroad managers have at different times in the past been willing to "squeeze" their local traffic to make up for losses on the through business, being deaf to the demands and entreaties of their local patrons, whose trade was being crippled by the excessive charges they alone were compelled to pay. In this sentence also the C. B. and Q. report gives one of the strong reasons for the long and short haul section. The local manufacturing or milling interests are as certainly competitive with those at the junction points as though they all stood alongside of each other. This long and short haul rule recognizes these principles, and while it is true that water and other competition may make a relaxing of the rule wise, it is equally true that the exceptions should be as few and the length of time as short as may be just to the holders of stocks and bonds.

Following the reasoning of the Burlington report, we are led back from the reduction of local rates to the reduction of the through rates, which is attributed to the prohibition of pools. In saying that some line would always be found to cut through rates, the Burlington could have pointed, as an example, to their own connection, the Burlington and Northern, which is precisely such a road having little local business. And yet circumstances justify this Northern Division of the C. B. and Q. in making the low quoted rates between Chicago and Minneapolis. The old rates could not be held up to-day even under the strictest pool; it is only a question of adjusting the rates at once or after protracted struggles. The old pooling system had indeed this advantage, that it made the inevitable reduction of rates come more slowly to the roads involved, but it could not stop such reductions unless the combination became so strong as to be of itself a menace to business. It is not necessary to attribute the lowering of the rates west of the lakes to the prohibition of pools, though that may have hastened it; a readjustment must have come in any event. The report further speaks of the great number of competing lines between the larger cities of the West, as complicating the problem since the help of pools is withdrawn. It would be an interesting matter, could we determine how many of these paralleling roads really owe their existence to the influence of the

pools which kept the rates from falling naturally, thus inducing the building of new lines for the sake of sharing a traffic made artificially profitable.

"Another effect of the law is its tendency to drive the jobbing trade to cities which enjoy water competition, and to reduce the amount of business at interior cities where heretofore a large aggregate traffic may have made it an object to fix lower rates than roads can accept on the retail trade of smaller towns. To take away from such centers by statute the natural advantages of the concentration of capital and trade is, to say the least, an experiment." So concludes the report. It opens a very difficult question, which we may refer to but briefly. It is a standard axiom with railroad men that they have a right to create trade centers at certain distances by discriminating rates. This alleged right is one of which they are very jealous, and is probably referred to in the phrase "natural advantages of capital and trade." It is also a well-known fact that a railroad can be more economically run when it deals principally with a few large cities and in large quantities rather than with an even distribution of jobbing trade from a number of wholesale points. But if a road could carry all its traffic for one or two firms only it would be still cheaper for it; but how would the other thousands of its shippers fare? It is clear that economy of management must not be allowed to overbalance the right of the individual to fair treatment. No merchant makes the same profit on every sale, and no railroad should expect it. Something must be allowed the small towns and the small shippers as a public duty. What should this allowance be? No definite answer can be given. It would seem that the public, in enacting the Interstate law, thought that the railroads had in practice allowed too much favor to junction points, and not enough to local towns, which, as the Burlington report asserts, are really competitive.

The Cost of Copper Mining.

For many years all but one of the great Lake Superior copper mining companies have published detailed annual reports which possess special interest now, since they afford an opportunity for gauging quite accurately the position of the Lake mines under the present extraordinary condition of the copper markets.

The Quincy, which on a paid up capital of \$200,000 had up to the beginning of the year distributed dividends aggregating \$4,610,000, produced in 1887 5,609,762 pounds of ingot copper, at a total outlay, including construction account, &c., of \$484,464.19, equal to 8.63 cents per pound of product. If it makes 6,000,000 pounds at 9 cents, and gets 15 cents as an average, it will be able to turn over to its shareholders \$360,000 as the profit of one year's working. The Franklin produced in 1887 3,915,838 pounds of ingot copper, its expenses footing up to \$398,016.20, which makes the cost 10.17 cents. On sales of copper aggregating \$486,124.03 it closed the year with a profit of \$90,851.99.

The Atlantic is another mine to which 12-cent copper brings no distress. Its yield in 1887 was 3,641,865 pounds, which sold at an average of 12.34 cents, its income being \$452,278.95. Excluding addi-

tions to plant and bad debts, figuring up \$9744.89, this little mine had outlays aggregating \$361,668.02, equivalent to a cost of 9.93 cents a pound. The mining profit for 1887 was \$30,610.93, while the net gain was \$80,866.04. When the consolidation of the Adams and the South Pewabic took place the value of the property was placed at \$659,642.11, for which \$700,000 in stock was paid. Assessments aggregating \$280,000 were levied. The result of the operations on sales of copper aggregating \$5,669,024.82 was a profit of \$704,966.13, from which dividends footing up to \$360,000 were paid. The Central, which is under the same management, originally had a capital of \$100,000 paid in, and has, up to this year, distributed dividends footing up to \$1,820,000. During 1887 the mine produced 1,923,279 pounds of copper, sold at an average of 12.17 cents, which realized a net profit of \$12,095.86, the cost being 10.15 cents.

The Osceola has produced since 1874 41,963,750 pounds of copper, for which it realized, at an average of 15.92 cents, \$6,682,286.86. Its original capital stock, all paid in, was \$1,250,000, and the dividends to date have amounted to \$1,072,500. In 1887 the mine yielded 3,583,723 pounds of fine copper, at a cost of 9.88 cents per pound.

According to an official report covering the last six months in 1887, the mining profit of the Tamarack, on an output of 4,617,371 pounds of refined copper, sold at 12.88 cents, was \$346,076.45, the cost being 5.39 cents per pound, and 7.37 cents laid down in New York, including the heavy construction account and the current outlay in sinking a second shaft. The present rate of output holds out the prospect that the yield will be at least 12,000,000 pounds this year.

The Calumet and Hecla, which is now about to get over its difficulties, may soon be expected to come up in product beyond its former rate of 4,000,000 pounds a month, and should certainly reach a total of 50,000,000 pounds this year, in spite of the disasters of the past six months. No exact figures of its cost are known to the public or to its shareholders generally, but its ability to prosper at a 10-cent rate for copper is well understood.

Here we have, then, the leading Lake mines capable of producing this year, if pushed, fully 82,000,000 pounds of copper, at a cost which leaves a liberal margin at 12 cents. We know that the leading Arizona and Montana mines can comfortably meet that figure. It is not too much to say, therefore, that if there is any truth in the statement that the world's supply is inadequate at £55 for Chili bars, which is equivalent to 12 cents, then American consumers are simply paying the piper. As a matter of fact, however, enough is known of costs in other parts of the world to emphatically make the statement that enough copper can be produced at a profit at £55 to take care of the world's requirements. Every dollar in excess of the normal figures stated is a tribute exacted by moneyed speculators from the consumers.

Messrs. Hussey & Pomeroy, of Cleveland, selling agents for the Girard Iron Company, have sent out a photograph of a very striking sample of pig iron. A pig was cut in the lathe with a screw thread on it, a number of deep cuts below it and with an ornamental base.

An Importer's Argument.

Dana & Co., importers of iron and steel, of this city, have placed in the hands of every Congressman a letter, dated April 20th, which is interesting as illustrating the line of argument put forward by those who sell foreign steel, and indicating the statements to be met:

"A bill to reduce taxation and simplify the laws in relation to the collection of the revenue." Such is the title of the bill brought to the attention of your Honorable Body by the Ways and Means Committee. In the face of such a title it is proposed to advocate a large increase in the rate of duty assessed under existing laws on steel in slabs and billets, assessing a specific duty of \$11 per ton, which amounts to an ad valorem rate of 63 per cent. These articles could appropriately be called under the present tariff laws, "Raw material," as it is fit for no use whatever, in the condition in which it is landed in the country, but must go through a manufacturing process before it can be put into articles ready and fit for use.

This increase would enhance the cost of low-priced basic steel, which is not produced in this country, and which many rolling mills find better adapted to their requirements than any other kind of steel.

It would probably lead to the importation of high-priced crucible (cast) steel in the form of billets and slabs, upon which a specific duty of \$11 per ton would be but a small percentage of their value. It is a discrimination against steel in billets and slabs as compared with other forms of low-priced steel, and in favor of the same in high-priced steel. It is manifestly unjust to assess the same rate of duty on steel in billets and slabs as on steel rails, the latter being a finished article ready for use in the condition in which it is landed.

Specific duties are preferable to ad valorem where possible, and such articles as steel in billets, slabs and wire rods are easily arranged so as to work no injustice to any. For instance, a specific duty of \$6.50 per ton on steel in billets and slabs valued at $2\frac{1}{2}$ cents or less per pound would be ample protection to the manufacturing interests of this country and of great benefit to consumers—this is equivalent to an ad valorem rate of 35 per cent.

Steel wire rods is an article of very large importation, which has been entirely ignored by the Ways and Means Committee bill. This article is only a partial manufacture of steel, and is an article of absolute necessity in this country, and after these rods have been manufactured here into fence wire they make the cheapest fence in the world for farmers, and the cheapest articles for many purposes of daily consumption. Furthermore, wire rods are not produced in this country to any extent except by three or four companies, who manufacture almost exclusively for their own wire mill consumption, and these are manufactured of Bessemer steel; whereas, the German and Belgian makers produce Basic steel, which has been found better adapted to the requirements of many consumers of wire rods in this country, who are the wire mills who draw rods down to various sizes of wire for fence and many other purposes of daily consumption.

The existing tariff assesses duty on this article under Section 180, which reads as follows: "Iron or steel rivet, screw, nail and fence, wire rods, round, in coils and loops, not lighter than No. 5 wire gauge, valued at $3\frac{1}{2}$ cents or less per pound, 6-10 of 1 cent per pound." Lighter gauge than No. 5 steel rods under Section 183 in the tariff as "steel not specially enumerated or provided for in this act, 45 per cent. ad valorem." Now, as this article of wire rods has become one of such importance to this country that clearly the duty should be reduced to the benefit of all the consumers of this country, or, at least, the duties should not be increased, as at present values abroad for the common basic steel wire rods lighter than No. 5 wire gauge the present rate of 45 per cent. amounts to closely approximating \$11 per ton, which is surely a protective duty quite large enough for any American manufacturer; at this time the American manufacturers can afford to undersell the imported article, except in a few cases of consumers of this class of material whose works are near the seaboard. Pittsburgh market can to-day afford to sell wire rods for at least \$1 per ton less than the cost of foreign with the all-rail freight added from seaboard to Pittsburgh, Pa.

You will, therefore, readily see that an increase in the rate of duty would result in an enhanced cost to all consumers and greatly to the benefit of American manufacturers, whose prices would at once be advanced, owing to their inability to supply themselves and the market demand.

A specific duty of 5-10 of one cent per pound on iron or steel rivet, screw, nail and fence wire rods, round, in coils and loops, valued at $2\frac{1}{2}$ or less cents per pound, would be

about equivalent to an ad valorem rate of 47 per cent., which would be less than present rate on rods not lighter than No. 5 gauge and more than present rate on rods lighter than No. 5 gauge, and would eradicate an irregularity in the existing tariff and simplify the collection, and could work no injustice to American manufacturers.

It will be seen that it is gravely suggested that the duty on steel billets, a form of manufacture of iron more advanced than pig, be placed practically on the same footing as pig iron. It is urged, in support of this position, that modern steel works in Europe do not make any pig iron at all, because they run the molten metal direct from the blast furnace into the steel converter. They do not cast it into pigs at all, therefore steel billets, the first product of the manufacture, should come in at as low a duty as pig iron. Comments on such an argument seem almost unnecessary. Leaving entirely out of consideration differences of cost of labor, supplies, &c., American producers of steel billets are entitled to a rate of duty which will allow for the waste in blowing and rolling. Placing Bessemer pig at \$20 at mill, a low average figure indeed, the waste of 15 per cent. alone would call for an addition of \$3 to whatever duty is placed on pig iron. We need not go at all into the question of a due protection to American labor engaged in the converting of the pig into steel and its rolling into ingots, nor to the allowance necessary to compensate for larger investment in plant.

The equivalents of specific and ad valorem duties named are clearly faulty on the face of them. The document quotes in one place \$6.50 equal to 35 per cent. rate, while at another \$11 is made to amount to 63 per cent. We submit that one must be wrong. If \$6.50 is equal to 35 per cent., then our reckoning makes \$11 equal to 59.2 per cent., and not 63 per cent.

A number of incorrect and misleading statements are made in regard to wire rods. Unfortunately we do not possess accurate statistics of their production in this country, but the output is large. A number of very important modern mills are engaged in their production, and their number is being added to at the present time. The principal reason why we are not making all that we need is because duties until now have been too low. At this very writing a combination of German and Belgian producers is engaged in an effort to squeeze American consumers. Prices have been advanced during the past six months from less than 90 marks at German mill, if the invoices of importers were correct, to 103 marks, and it is only recently, chiefly because of the determined holding off of American consumers, that they have reduced them to 105 marks at shipping port, or 99 $\frac{1}{2}$ marks at inland works on an average. Taking 92 marks as a fair normal price, when the market is not being manipulated by a pool, an ad valorem rate of 45 per cent. is equivalent to \$10.02, and not \$11, as the letter puts it. The duty on wire rods, if any semblance of harmony is to prevail, should be considerably higher than that on steel rails, since it costs considerably more to roll them. With English rails at £4 at shipping ports, the normal price for German wire rods at Antwerp would be £4. 17/6 to £5, under free competition. In other words, rods cost from \$4 to \$5 per ton more. Under the duty suggested by the letter of the importers quoted they would be placed at the same figure, and that assumes, too, that \$11 a ton is fair rate on steel rails.

One point contained in the document quoted, which we have repeatedly heard references to among sellers of foreign iron and steel, but to which little attention appears to have been given thus far by American manufacturers, is the probable importation, under the Mills bill as now framed, of high-priced crucible steel in

billets and slabs. The point is one which our crucible steel manufacturers and the consumers of this class of material should carefully look after.

Washington News.

(From Our Own Correspondent.)

WASHINGTON, D. C., April 24, 1888.

After an introductory spurt of one day the revenue bill has passed over a whole week without another step in advance. The two parties in the committee have been engaged in a controversy on the question of the amount of time to be allowed for general debate. The Republicans claim ten days of five hours each and no night sessions, and the Democrats half that time or night sessions. The Randall Democrats are left out in the cold in the farming out of time, and yet they hold the power to extend or limit. The Democrats of the committee are powerless to proceed except in obedience to the plans and purposes of the other side. Having passed five months in star chamber proceeding in formulating their bill the majority of the committee are trying to cut down to five days for general debate.

The House will take another turn at the parliamentary machine to-day on the revenue bill, Representative McMillin, of Tennessee, talking for and Representative Burrows against the bill. The speech of Judge Kelley has been very severely criticised by the Republican protection press, in which the Western Republican Representatives unite. It is considered to have been a very serious mistake to have put him ahead in this contest, as his views are regarded as narrow and prejudiced, and not in harmony with Republican sentiment in New England and the West. Representative Burrows is expected to draw the line vigorously and unmistakably without any dry and irrelevant reminiscences. The protection influence in the Republican party will be amply asserted, and the issue presented as it will be fought over in the approaching campaign.

Speaker Carlisle is feeling somewhat dubious about Congress getting away much before September. The appropriation bills and general legislation have strength enough to hold the right of way if they wish. At the same time he does not favor an adjournment until some action shall have been taken on the Mills bill.

The officers of the steel inspection are very much gratified over the results of the official tests at the Washington Navy Yard of specimen bars of steel cut from the sinking-head of the Hainsworth gun, cast by the Pittsburgh Steel Casting Company. The gun is a new departure from the accepted theories of ordnance authorities on gun construction, and from the tests made threatens to revolutionize this important branch of warlike preparation. The tests are beyond what the contract calls for. The final tests will now be awaited with increased interest. An account of the tests sent here says: The tests made in Washington show a wonderful elastic limit, which is considered among naval and military men to be the main point necessary for the gun to pass through the firing test. It is nearly one-fourth greater than what the casting company set out to make it. The hardening of the steel to obtain the high elastic limit was done to some extent at the expense of the reduction, still the average reduction shows itself to be above the necessary percentage. The steel from which the specimen bars were cut was the poorest steel in the cast. They were from the sinking head, which would naturally contain all the slag, &c., and it is evident that if there is any difference whatever the steel of the gun is of even a higher grade than that of the bars

tested on Friday. There were eight tests made, three from the muzzle and five from the breach of the gun. They gave the following results:

| From the Muzzle. | | | | |
|-------------------|-----------------------|--------------------|-----------------------|----------------------|
| | Tensile strength, lb. | Elastic limit, lb. | Elongation, per cent. | Reduction, per cent. |
| Longitudinal..... | 81,185 | 40,464 | 18.00 | 21.26 |
| Transverse..... | 79,958 | 43,390 | 18.28 | 20.79 |
| Transverse..... | 79,174 | 40,979 | 15.55 | 18.75 |
| From the Breech. | | | | |
| Longitudinal..... | 88,871 | 51,948 | 9.15 | 10.89 |
| Longitudinal..... | 89,686 | 51,948 | 10.00 | 13.88 |
| Transverse..... | 75,629 | 51,948 | 2.65 | 2.79 |
| Transverse..... | 73,847 | 59,332 | .60 | 1.69 |
| Transverse..... | 73,336 | 55,358 | 1.85 | 4.35 |
| Average..... | 80,198 | 49,395 | 9.50 | 11.41 |

When the Steel Casting Company took the contract to make the gun they agreed to produce a gun the physical characteristics of which should be, tensile strength, 80,000 pounds per square inch; elastic limit, 40,000 per square inch; elongation, 7 per cent., and reduction 8 per cent. A comparison of these figures with those of the tests made in Washington will show that the steel is considerably above that which they undertook to turn out.

SYNOPSIS OF DECISIONS.

The following synopses of customs decisions relating to metallurgical cases have just been issued:

"Coerulein," so called, is dutiable as a coal-tar product.

Flat steel rivet-rods, in coils, are dutiable for "steel not specially enumerated or provided for," and not for "iron and steel * * * rods, round, in coils and loops."

Old copper wire imported for the purpose of being brazed, run through the drawing machine and exported, does not come within the provision of the revised statutes authorizing the importation in bond of machinery for repair, but may be entered for exportation (after remanufacture) with benefit of drawback.

Certain air meters, used by miners in shafts and by architects in flues to measure the velocity of air currents, are not free of duty as philosophical and scientific apparatus, but are dutiable as manufactures in part of metal.

Certain so-called "charcoal," which consists of small, evenly-shaped blocks, specially prepared, chiefly from carbon and partly from oxide of manganese, for use in electric batteries, and commercially known as carbon "blocks" or "plates," are dutiable at the rate of 20 per cent. ad valorem.

Tinned sheet iron, cut in strips from 1½ to 3 inches wide, and from 6 to 18 inches long, and adapted for use in various kinds of manufactures, is dutiable as articles composed in part of iron, and not as scrap iron or "waste."

An English Government report just issued contains the following table, showing the daily pay of several classes of workmen, which is extracted from the return made by the proprietors of the celebrated works of John Cockerill & Co., at Seraing, near Liège:

| | 1872. | 1875. | 1878. |
|----------------------------|-------|-------|-------|
| | s. d. | s. d. | s. d. |
| Coal miners..... | 2 5 | 3 4½ | 2 5½ |
| Coke makers..... | 2 2 | 2 6½ | 2 3 |
| Miners..... | 1 10 | 2 1½ | 1 11½ |
| Blast furnacemen..... | 2 5 | 2 7½ | 2 4½ |
| Founders..... | 2 4½ | 2 7½ | 2 6 |
| Iron-makers..... | 2 8 | 3 0½ | 2 11 |
| Steel-makers..... | 2 10 | 3 3½ | 3 0½ |
| Constructors..... | 2 6½ | 2 11½ | 2 8½ |
| Boiler-makers..... | 2 5½ | 2 10 | 2 6½ |
| Naval yardsmen..... | 2 1½ | 2 7 | 2 5 |
| Forgers and hammerers..... | 2 9½ | 3 2 | 2 9 |
| Carriers..... | 2 6½ | 2 8½ | 2 4½ |
| | 1881. | 1884. | 1886. |
| | s. d. | s. d. | s. d. |
| Coal miners..... | 2 6½ | 2 7½ | 2 4½ |
| Coke makers..... | 2 3 | 2 2½ | 2 1½ |

| | | | | | | |
|----------------------------|---|-----|---|-----|---|----|
| Miners..... | 2 | 0 | 2 | 0½ | 1 | 11 |
| Blast furnacemen..... | 2 | 3½ | 2 | 3½ | 2 | 2½ |
| Founders..... | 2 | 5½ | 2 | 4 | 2 | 3½ |
| Iron-makers..... | 2 | 8 | 2 | 9 | 2 | 5½ |
| Steel-makers..... | 2 | 10½ | 2 | 10½ | 2 | 8½ |
| Constructors..... | 2 | 9 | 2 | 9 | 2 | 8½ |
| Boiler-makers..... | 2 | 6½ | 2 | 7½ | 2 | 6½ |
| Naval yardsmen..... | 2 | 5½ | 2 | 4½ | 2 | 5½ |
| Forgers and hammerers..... | 2 | 10½ | 2 | 8½ | 2 | 9½ |
| Carriers..... | 2 | 6 | 2 | 8½ | 2 | 9 |

OBITUARY.

ALFRED NOBEL.

The world has lost one of its greatest experimental chemists by the death of Alfred Nobel, the inventor of dynamite, and the man who made the wide use of nitro-glycerine practicable. The new explosive that Sombroer discovered in Paris 41 years ago, by treating glycerine with sulphuric and nitric acid, was never practically applied until, after years of experimenting, Nobel succeeded in producing nitro-glycerine in a form that admitted of comparatively safe handling. The knowledge of which Nobel's long investigations were the fruit was not obtained without the sacrifice of some human lives. Among the victims of the terrible explosive he perfected was one of his brothers. Nobel was a Swede, and in the quarries of that country he first demonstrated the efficacy of nitro-glycerine in its improved form. It was not long, however, before the use of nitro-glycerine for blasting purposes was superseded by Nobel's later discovery of dynamite, which is now generally regarded as the safest as well as one of the most powerful of explosives. Few families of the present day have made so remarkable a record as that of the Nobels. The father, who was in humble circumstances, won a comfortable fortune at one stroke by a torpedo which he sold to the Russian Government. The brothers Ludwig and Albert created the present great petroleum industry of Baku. They substituted pipe lines for ox wagons for the delivery of oil at the refineries; doubled the yield of oil by improved methods of boring; invented the system of carrying petroleum in bulk in cistern steamers, which they found far more economical than the transport of oil in barrels, and developed methods for the cheap transportation of their product far and wide in Europe. While their brother Alfred became a great manufacturer of explosives, they have for years produced more refined petroleum than all the other European oil companies combined.

A legal contest has been commenced by the heirs of the late Benjamin B. Hotchkiss, the inventor of the Hotchkiss gun, who allege that property has been conveyed without their consent, and claim heavy damages. The estate was valued at \$12,000,000. Mr. Hotchkiss was a brother of C. A. Hotchkiss, of this city, and a partner in the firm of Hotchkiss's Sons here, manufacturers of all kinds of light hardware. Mr. Hotchkiss invented 35 years ago the first rifle cannon ever made. It attracted universal attention, was taken to England and examined by those skilled in the science of gunnery and the laws of projectiles, was presented to the Mexican Government, captured by Maximilian, and was sent by him to the Empress Eugenie as a present, and she caused it to be placed in the War Department, Paris, where it now is. At the breaking out of the late civil war he invented a bombshell which was adopted by the Government and largely used during the war. In 1861 he went to Europe, and in the fall of that year went into the cartridge business in Vienna. After the capture of Paris by the Germans he secured a large contract from the French Government and removed his establishment to the South of France. He invented a system for a magazine breech-loading rifle possessing features of great excellence, and now controlled by

the Winchester Arms Company, of New Haven. This rifle was adopted by the Ordnance Department of the United States and 20,000 of them were ordered. He began experimenting on his machine gun in 1870 and spent six years studying out improvements. The gun is something like the Gatling, but has a less number of parts, and is simpler and more effective. It carries bombshells instead of solid shot, discharging from 60 to 80 per minute and sending them a distance of 4 miles. The bombs explode at the instant of contact with any substance and burst into many pieces. The guns have been adopted by the French, German, Swedish, Chinese, Brazilian, Italian and English Governments.

An Old Chinese Printing Establishment.

A correspondent of the North China Daily News, of Shanghai, describes a printing establishment which he found in a village in the interior, about 150 miles from Shanghai. The printing was being temporarily carried on in the village temple, and movable type only was used. In the large central hall of the temple were placed about 20 ordinary square tables, on which the cases of type were spread out, very much after the English method, only taking up much more room. At the time of the visit one man was engaged in setting up type; another was printing. The former stood before a table, on which was what may be called the Chinese "case." It was a solid block of hardwood, about 22 inches long by 15 inches broad, and perhaps 3 inches deep. The inside was hollowed out to a depth of about ¼ inch, this depression being still further hollowed out into grooves about ¼ inch deep. The block had 29 of these grooves, each filled to the depth of ¼ inch with ordinary stiff clay. With his copy before him, armed with a small pair of iron pincers, the compositor began his work; character after character was transferred from the case and firmly pressed into the clay. When the "form" was complete, a flat board was placed on the top and the characters pressed perfectly even and level with the surface of the wooden block, the edge of which was cut to form the border generally found round every Chinese page. The printer now received the form, and carefully brushed his ink over the type. Taking a sheet of paper, he pressed it down all over the form, so that it might be brought in contact with every character. He then removed the sheet and examined each character, carefully adjusting those which were not quite straight with the pincers, and apparently never touching the type with his fingers. After sufficient copies had been struck off, the type was distributed, each character being returned to its particular box. The type in the form was of three sizes, each character being kept in place entirely by the clay in which it stood. They were cut out of some hard wood and were perfectly square. The writer was told that the art of printing in this way had been handed down in the same family since the Sung dynasty, more than 600 years ago. No strangers were ever taught, apprentices being always taken from the same clan. They were open to take any work at the rate of about a shilling a day, which included the two men, type and ink, but not paper. They were then printing family registers. The custom in that part of the country is to hire the printers, who bring their type and set up their printing establishment on the spot. In this way the same business has been carried on in one family for six centuries, and during all this time movable type only had been used in the manner here described.

Foreign Markets.

EQUIVALENTS.

| | Cents. |
|------------------------------|--------|
| Franc (Portugal & Lira)..... | 9.3 |
| Florin (Netherlands)..... | 10.2 |
| Florin (Austria)..... | 35.4 |
| Millon (P. Russia)..... | \$1.8 |
| Millon (Brazil)..... | 54 |
| Mark (Germany)..... | 22.5 |
| Kilogram..... | 2.205 |
| Picul..... | 131 |

EAST INDIES.

MANILA, April 16, 1888.—*Hemp*.—The nominal quotation is \$8.43, against \$8.50 a year ago, 2 picul, equaling 2 ton cost and freight £30. 2/6 against £28. 10/. There have been cleared for the United States since January 1 only 43,000 bales, as compared with 76,000 same time last year, there having been no clearances since the last cable, while last year 2000 bales had cleared; loading for the same destination, 24,000, against 9,000. The clearances for England since January 1 have been 107,000 bales, against 64,000 in 1887, while there are still loading 10,000 bales against 11,000. Clearances for all other countries, 24,000, against 11,000; receipts at all ports since last cable, 19,000, against 9,000; ditto since January 1, 176,000, as compared with 132,000 last year and 115,000 in 1886. Freight, \$5. *Exchange*, 3/8, against 3/5 last year.—*Ker & Co. per cable direct to Chas. Nordhaus.*

SINGAPORE, April 16, 1888.—*Tin*.—No shipments have been made to the United States during the first half of the month, whereas last year 50 tons were shipped; to England there were 600, against 600 same time last year. Since January 1 there have been exported from the Straits settlements to the United States 630 tons, as compared with 1500 tons in 1887; to England, 8400 tons, against 380.—*Gillman, Wood & Co., to Chas. Nordhaus, N. Y., per cable.*

COLOMBO, March 3, 1888.—*Plumbago*.—Our market has been moderately active and steady at ensuing quotations in rupees 2 ton: Large Lumps, 150 @ 160; Ordinary ditto, 115 @ 147.50; Chips, 80 @ 91.50, and Dust, 37.50 @ 60. *Coir Yarn*, Nos. 1 to 4, 7 to 12 rupees 2 cwt.; Ebony, 120 @ 135 rupees 2 ton. There have been shipped since October 1 to England, 44,866, cwt. of Plumbago; to Marseilles, 38 cwt.; to Hamburg, 3973; to Antwerp, 1948; to Bremen, 206; to India, 82, and to the United States, 63,412 cwt., together, 141,527 cwt., as compared with 102,284 last year, 81,546 in 1886 and 80,695 in 1885.—*Exchange*, six months' sight, London, 1/5.—*Volkart Brothers.*

AUSTRALIA.

MELBOURNE, VICTORIA, April 5, 1888.—*Iron*.—The outlook in the iron trade remains encouraging, although the sales effected during the fortnight have, on the whole, been moderate in volume. Prices are fully sustained, importers showing no disposition to shade them in the least. *Tin*.—Shipments during the fortnight from the mainland and Tasmania sum up 475 tons.—*Per cable via London.*

SPAIN.

BILBAO, April 7, 1888.—*Iron Ore*.—Although the demand was good, but few transactions occurred. The market remains firm at 7/9 @ 8/ for Campanil, and 7/ @ 7/3 for Rubios. The stock of Ore is by no means large, mine owners limiting their output to meeting current requirements for the dispatch of steamers as they make their appearance. Not many of them have lately arrived, so that some drops have no steamers to load. Shipments for the week have been fair, considering the time of the year, say 94,472 tons for export. There have been shipped, since January 1, altogether 1,024,58 tons, as compared with 1,173,355 same time last year. *Pig Iron*.—During the week 4819 tons have been exported to Italy, the coastwise movement being 1628 tons. The Spanish Cortes have voted the sum of 171,000,000 pesetas or francs set aside to complete the navy of the country, with the proviso that the men-of-war to be built are to be constructed in Spain, out of Spanish material exclusively. At an adjudication which has just come off for the building of three armored cruisers of the capacity of 7000 tons each, and three torpedo gunboats of the first class, nine firms handed in their tenders for the first and five for the latter, Bilbao and Catalonia being prominently represented. Among the applicants are the firms of C. Morrista & Co., O. Mordat & Co., and others, but Cadiz, Malaga and Galicia are also ready to build men-of-war. Two London firms having branch works in Spain have applied. The committee appointed by Parliament to investigate the tenders will soon make its returns.—*Bilbao Maritimo and Comercial.*

GERMANY.

HAMBURG, April 14, 1888.—*Iron*.—The Rhenish-Westphalian Iron market has on the

whole quieted down somewhat, especially in Pig Iron, without bringing about a quotable decline. Luxembourg Pig has remained steady at 38.60 marks. Most of the blast furnaces have sold their output to July 1, some to October 1, and a few for the whole year. Both for domestic use and export the demand for Spiegel has fallen off, which, however, does not prevent prices from being fully sustained, stocks being quite reduced. The prices of Coke and Iron Ore are besides so high that there is little likelihood for Spiegel to decline below the current price of 59 marks for 10 to 12% Manganese. Forge Pig is dull, but few large orders dropping in, rolling mills having covered their immediate requirements, most of them, the price being 50 @ 52 marks. There has been no change in either Foundry, Thomas or Bessemer. The range for the first named is 51 @ 59 marks, Thomas 45 @ 46 and German Bessemer 54 and over. Merchant Iron has been decidedly more active, while Boiler Plates and Sheets of all sorts are fully sustained. There is nothing new in the Wire branch. Foundries and carworks are satisfactorily engaged in filling orders lately received. Metals are moderately active and unaltered.—*Borsenhalle.*

BELGIUM.

BRUSSELS, April 14, 1888.—*Iron*.—During the week under review the Belgian markets have become more sluggish; the rupture among Belgian ironmasters may lead to a reaction, but so far no actual decline is noticeable. Part of the dullness may also be ascribed to the interminable winter, which has arrested works and enterprises in all directions in Belgium. Two months have been lost and the work of nine months will have to be crammed into the next seven months, hence it is to be presumed that the latter will be more active than they would otherwise probably have been. Pig Iron production has been on the increase recently. Out of the 50 blast furnaces in Belgium, 32 are blown in and 18 blown out at present. Steel works are but moderately booked, especially in Rails. There is a good demand still, it is true, for Steel Plates, but prices do not improve. Machine shops complain of the lack of work, especially the locomotive makers. The Government has, meanwhile, given the St. Leonard works some army orders. Forge Pig may be quoted 4.80 francs 2 100 kg. at Luxembourg, and 5 @ 6 francs at Charleroi. Merchant Iron is worth 11 @ 11.50 francs 2 100 kg. Steel Sheets are worth 17 @ 18 francs. The Sandberg heavy Steel Rail weighing 52 kg. 2 running meter seems to be a success on the Government lines of this country and 8000 tons will be ordered for the same without delay.—*Moniteur Industriel.*

FRANCE.

PARIS, April 14, 1888.—*Metals*.—With the advent of milder weather the demand has become a little brisk at ensuing quotations in francs 2 100 kg.: *Copper*, Chili Bars, 200 @ 205; Ingots and Slabs, 195; Best Selected, 200, and pure Corcoro Ore, 180; *Tin*, Banca, 245; Billiton, 135; Straits, 430, and English, 405; *Lead*, 36.50 @ 37.50; and *Spelter*, 51.50 @ 52. *Iron*.—The Paris market quotations have been weak at 13 @ 14 francs for Merchant, at which dealers continue selling the same. Ironmasters in Northern France have been unable to arrive at an understanding with those of Central France. Even at the North disagreement is cropping up. Two important rolling mills, the Blanc-Misseron and the Frith-St. Léger, have severed from the syndicate; even some members of the syndicate, as it stands, are understood to have sold at figures below the official price list to the extent of 1 franc 2 100 kg. The entire situation is thus suddenly being undermined and upset in France; meanwhile the rolling mills near Paris turn out as much as they can, chiefly of Merchant Iron, but also some Beams. Those of Troy and Alfortville would turn out more if they could get Scrap Iron cheap enough, but it seems to be scarce.—*Moniteur des Intérêts Matériels.*

AUSTRIA.

VIENNA, April 11, 1888.—*Iron*.—Business is slowly, but steadily, improving in Austria-Hungary. This relates more particularly to Merchant, Sheets and Beams, prices at the same time remaining firm. We quote in this city, in florins 2 ton: Pig Iron, 38 @ 47, Merchant, 110 @ 125; Sheets, 145 @ 170; ditto Galvanized, 255 @ 315, and Beams, 122 @ 127.50. Metals—Have been livelier at irregular figures. We quote 2 100 kg.: *Copper*, 107; *Lead*, 22.50; *Spelter*, 26.50; *Antimony*, 54; *Tin*, 216 @ 218, and *Nickel*, 230.—*Handels Journal.*

Robert W. Hunt, late general superintendent of the Troy Steel and Iron Company, has established the Robert W. Hunt & Co. Bureau of Inspection, Tests and Consultation. The general office of the bureau is located in the Rookery Build-

ing, Chicago, with branch offices in the Hamilton Building, Pittsburgh, and at 161 Broadway, New York. Mr. Hunt's associates are John J. Cone, G. W. G. Ferris, Frank C. Osborn and James C. Hallsted. The speciality of the bureau will be the inspection of rails. Resident inspectors will be stationed at each rail mill, who will be directly under Mr. Hunt's personal supervision, his time being divided among the various mills. These inspectors will be engineers of education and character. The bureau will have its own chemical and physical laboratories, in which the steel furnished its clients will be investigated from time to time by competent chemists and engineers. In addition to the mill inspection and tests of rails, Mr. Hunt proposes to introduce a new feature in this country—namely, the examination of rails when laid in railroad company's tracks, either with their officers or independent of them, as may be desired. It is Mr. Hunt's intention, as a thoroughly practical and experienced rail manufacturer, to give his clients in every way the benefit of his knowledge of the iron and steel business, extending his inspection of rails and other railway material beyond and behind the finished articles, including as far as practicable the earlier stages of their manufacture. He is also a member of the firm of G. W. G. Ferris & Co., of Pittsburgh, whose business is the inspection and tests of structural and similar materials, also the designing of bridges and other structures. T. W. Yardley, who has been in the iron business for many years, having built the Elmira Rolling Mills, at Elmira, N. Y., and the United States Rolling Mill, at Chattanooga, Tenn., and more recently connected with the Troy Steel and Iron Company, is also associated with Mr. Hunt, and has charge of the Chicago office of the bureau.

The First Pumping Engine Company.

We are apt to forget how much science and the arts owe to speculation and the desire for sudden enrichment. We laugh at the simplicity of the dupes of 1720, who, not content with plunging in South Sea stock, lent their ears and their money to a crowd of company mongers, not remembering how many of these so-called bubble schemes were real steps on the road to a widely-extended prosperity. Of 26 principal bubbles satirized in a well-known though somewhat scarce caricature entitled "The Bubbler's Mirror; or, England's Folly," published in 1721, nine at least contained the germs of businesses of the most profitable nature, now full grown and widely branched. Fire insurance, life insurance, cattle insurance, coal carrying and similar ventures had their heyday of inflation, and were then, as in a moment, utterly discredited. It is of a different sort of a project that I now write, prompted by four lines which I have just come across in the "Epilogue by a Looser," appended to a tract entitled "The Broken Stock Jobber," 12mo, London, of 1720:

Why must my stupid Fancy ever admire
The way of raising Water up by Fire?
That cursed Engine pump'd my pockets dry,
And left no Fire to warm my Fingers by.

In the "Bubbler's Mirror" this very project is thus pilloried:

Water Engine.

Paid in 4 Pound
Sold at 30 Pound

Come all ye Culls, my Water Engine Buy
To Pump your flooded Mines and coal pits dry,
Some Projects are all Wind, but ours is Water,
And tho' at present low may rise hereafter.

The water engine must have been either Savery's or Newcomen's.—*Notes and Queries.*

TRADE REPORT.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]
LONDON, WEDNESDAY, April 25, 1888.

The Pig Iron market has undergone no material change. Middlesboro' and Bessemer have been in less demand, but are held quite firmly, and Scotch is still rather slow, with prices favoring buyers on the cheaper sorts. The Manufactured Iron trade has been slow, and, while not quotably lower except on Black Sheet, prices are somewhat in buyers' favor. Steel Rails and Billets are meeting with very fair sale at steady prices, but Blooms and Slabs are slower at rather easier prices, and Wire Rods are very quiet. The transactions in Old Rails, Scrap Iron, &c., are small. Tin Plates are lower for prompt delivery, and have been sold for future deliveries at prices below those quoted for spot.

There is a better feeling in the Tin-Plate trade, consequent upon an improved demand from the American market and favorable prospects of a larger business in the immediate future. These conditions have led to the starting up of several mills that have been idle for some time past, the policy evidently being to secure business at present low figures rather than immediately advance prices. Preparations are now under way for starting up no less than eight idle mills. These include four of the Lion mills, operated by Philip S. Phillips; two of the Caldicot Tin Plate Company's mills; one of J. Chiners & Sons' Gwendralth mills, and one of the Glanwali mills.

There is not the slightest improvement in the trade demand for Copper, and the market is wholly bare of support other than that given by the "syndicate." The fact that Chili Bar futures are at a discount from spot prices checks outside speculation, and there is irregularity on Best Selected English Copper that is not without effect. Those English smelters who are under agreement with the "syndicate" keep their price at £82, but outside smelters offer at £79, and find only a moderate outlet. All descriptions of what may be termed non-speculative Copper are, in fact, rather weak, despite the seeming firmness of Chili Bars for prompt delivery.

The Pig Tin market is in a very ambiguous condition. The syndicate, it is said, still stand ready to buy, and do actually take up all lots for prompt delivery that may be offered at £166. Still, deliveries 60 days' ahead were offered at £137 and refused, while on three months' futures they appear to be sellers rather than buyers. London merchants are generally of the opinion that a collapse is more than probable at no distant date.

The export movement of Pig Iron is improving to a remarkable extent, and shipments have been large the past week to all countries except the United States. The activity in several departments of the Steel trade continues to hold the market very firm for Hematite Pigs. The demand for Steel is most prominent in the instance of the descriptions adapted for shipbuilding.

The Cockerill Company, Belgium, have secured an order for 2000 tons Steel Rails for a German railway.

The Glengarnock Steel Works have notified their workmen that their contracts will expire in 14 days. There are no signs yet of any trouble resulting.

Merry & Cunninghame, producers of the Glengarnock and Carnbroe Iron, are blowing in five additional furnaces.

The Parkgate Iron Company expect to be in a position to start their new Steel works in the autumn. The output at the beginning will probably be 100 tons per day.

The Glasgow Exhibition will have a grand display of model Iron and Steel metal wares.

Scotch Pig.—Very little improvement in the demand, and prices rather weak, particularly on the poorer grades.

| | |
|---------------------------------|------|
| No. 1 Coltness, f.o.b. Glasgow. | 48/ |
| No. 1 Summerlee, " " | 48/ |
| No. 1 Gartsherrie, " " | 45/ |
| No. 1 Langloan, " " | 46/ |
| No. 1 Carnbroe, " " | 40/6 |
| No. 1 Shotts, " at Leith. | 46/ |
| No. 1 Glengarnock, " Ardrossan. | 44/ |
| No. 1 Dalmellington, " " | 40/ |
| No. 1 Eglinton, " " | 39/3 |

Steamer freights, Glasgow to New York, 5/ @ 6/; Liverpool to New York, 7/6.

Cleveland Pig.—The market remains firm in tone, but business has been smaller. No. 1 Middlesboro', G. M. B., 34/3; No. 3 do., 31/9.

Bessemer Pig.—There is less demand, but prices are fairly well maintained. West Coast brands, mixed numbers, 43/6, f.o.b.

Splegeleisen.—Demand still moderate, but prices held firmly. English 20 % quoted 75/ f. o. b.

Steel Rails.—The market very steady, with a fair business passing. Standard sections quoted at £3.18/6, f. o. b. at works.

Steel Blooms.—A fair business passing, but prices rather easier. We quote at £3.15/ for 7 x 7, f. o. b. at works.

Steel Billets.—Demand continues good and prices are firm. Bessemer, 2½ x 2½ inch, £3.17/6, f.o.b. at works.

Steel Slabs.—Rather weaker tone to the market, and demand light. Bessemer, £3.15/, f.o.b. at works.

Steel Wire Rods.—Very little doing and prices nominal. Mild Steel No. 6 quoted at £5.10/, f.o.b. at works. No. 5 about 2/6 less.

Old Rails.—Rather weak market and sales light. Tees quoted at £2.17/6, and Double Heads £2.19/3, c.i.f., New York.

Scrap Iron.—Demand slow and the market rather weak. Heavy Wrought at £2.5/ @ £2.7/6, f.o.b.

Crop Ends.—Dull market and prices in buyers' favor. Bessemer quoted £2.5/ @ £2.7/6, f.o.b.

Tin Plate.—A fair business passing, but prices irregular and in buyers' favor. We quote, f.o.b. Liverpool:

| | |
|---------------------------------|------------|
| IC Charcoal, Allaway grade | 16/ @ 16/3 |
| IC Bessemer steel, Coke finish. | 14/ @ .. |
| IC Siemens " " | 14/ @ .. |
| IC Coke, B. V. grade. | 13/9 @ .. |
| Charcoal, Terne, Dean grade. | 12/9 @ 13/ |

Manufactured Iron.—Only a moderate demand. Prices lower on sheets, but otherwise without change. We quote, f.o.b. Liverpool:

| | | |
|---------------------------|-----------------|---------|
| Staff, Ord. Marked Bars | 7 10 0 @ .. | £ s. d. |
| Common " " | 5 0 0 @ 5 2 6 | |
| Black sheet, singles | 6 5 0 @ 6 10 0 | |
| Welsh Bars (f.o.b. Wales) | 4 15 0 @ 4 17 6 | |

Tin.—Spot prices firm, but futures irregular and unsettled. Straits closed at £166, spot, and £115, three months' futures.

Copper.—Only a moderate business and prices without material change. Chili Bars, spot, closed at £80.5/ @ £80.7/6. Futures, £77.15/. Best Selected, £82.

Lead.—The demand moderate and prices barely steady. Soft Spanish, £14 @ £14.2/6 at the close.

Spelter.—Market firmer and more active. Silesian, ordinary, £17.15/ at the close.

Financial.

OFFICE OF THE IRON AGE.
WEDNESDAY EVENING, April 25, 1888.

The most potent factor in the week as related to general business is the prompt action of Secretary Fairchild in recognizing the authority conferred by Congress to purchase bonds. The bonds offered on Monday in response to the recent circular were \$1,189,600 of 4½ per cents, at rates ranging from 107 62-100 to 108 16-100, and \$635,000 4 per cents, at rates ranging from 124 70-100 to 125 98-100. The bonds accepted were \$85,000 of 4 per cents, at rates ranging from 124 70-100 to 125. The Secretary made the purchases on a carefully computed statement showing the 4 per cents at 125 % to be a better bargain for the Government than 4½ per cents at the lowest rates offered. The Secretary believes that bonds can be secured at reasonable prices in sufficient quantities if the Department shows its intention to insist upon favorable terms. In the view of representative bankers, the immediate benefits derived from the bond purchase above noted consist in the assurance thereby afforded that the Treasury surplus is available for relief in case of future stringency rather than in the amount involved, which is of little significance otherwise, only as showing that there is no present lack of money. The Secretary's call for bonds resulted immediately in an easier money market and free offerings by the banks of money on time. The bond market, both for Government and for State and railroad bonds, was among the first of the markets to register the feeling of greater hopefulness. Accordingly there was an advance in the prices of all Government bonds, amounting in some cases to more than 1 % for the week. Both registered and coupon 4½ % bonds of 1891 advanced from 106½ on April 14 to 107½ on April 21, while 4 per cents of 1907 coupons advanced in the same time from 123½ to 124½.

The Stock Exchange markets were active and stronger, influenced very largely by the declared policy of the Treasury with reference to bond purchases. There was an advance on Thursday, also on Friday, but with more disposition to realize, and the week ended with the bulls in control. Northern Pacific was particularly in favor. On Monday the limited bond purchases had little effect, as it was not expected that many bonds would be offered in the present easy condition of the money market. On Tuesday the Secretary accepted \$600,000 of the bonds offered, and the market was buoyant, with limited reactions. To-day the previous advance was fully maintained; sales were large, and business was widely distributed through the list.

United States bonds closed as follows:

| | |
|-------------------------|-------------|
| U. S. 4½s, 1891, coupon | 107½ @ 107½ |
| U. S. 4s, 1907, coupon | 125½ @ 125½ |
| U. S. Currency 6s, 1895 | 121½ @ .. |
| U. S. Currency 6s, 1896 | 123½ @ .. |
| U. S. Currency 6s, 1897 | 125½ @ .. |
| U. S. Currency 6s, 1898 | 125½ @ .. |
| U. S. Currency 6s, 1899 | 130 @ .. |

The general trade conditions are more hopeful, although as yet developments do not indicate an active beginning of spring trade. Dry goods jobbers speak of a large volume of business during the week, partly the result of "drive" sales of popular fabrics. Wholesale grocers consider the prospects as encouraging, although goods are handled at small profits. Sales in March were larger than for the same month last year, and April is better yet. Wheat in speculative circles advanced sharply on bad crop reports and European uncertainties, but spot stock is dull in the absence of foreign demand, shippers' limits being under the market. Detailed information gathered by the Cincinnati *Price Current* respecting winter wheat "justifies the view that the average promise is decidedly lower than a year ago." The coffee market is influenced by diminished consumption and a production stimulated by excessive prices. Cotton is cheaper for April than before for many years, with a single exception. It is now estimated that the cotton crop will range close to 6,900,000 bales. Statisticians, Government and other, are now trying to explain their previous low estimates.

The imports of merchandise at this port were lighter than for some time past, amounting to \$8,588,000. Since January 1 the total is \$155,433,000, as compared with \$147,968,000 for the corresponding period in 1887 and \$137,055,000 in 1886. The exports of merchandise were valued at \$6,156,482, making a total of \$91,947,199, against \$93,942,724 in 1887 and \$95,252,000 in 1886. The items include 277,000 bushels of wheat, 21,111 bales of cotton, 5,000,000 gallons petroleum.

The clearings of 37 cities last week show a decrease of 10.3%, compared with last year. Outside of New York there was an increase of 1.7%, Philadelphia decreased 2.7, Boston 3.2, St. Paul 7.9, Cincinnati 11.6, New Orleans 14.2, Baltimore 12.9, Cleveland 15.3, New York 16.5 and Wichita 20%. Milwaukee gained 8.9, St. Louis 10.3, San Francisco 10.8, Chicago 11.1, Pittsburgh 13.3, Omaha 15.1, Memphis 16.6, Duluth 33.1, Minneapolis 31.5, Peoria 47.2, Denver 35 and Detroit 49.9.

The bank statement showed an increase of \$3,375,875 in surplus reserve, bringing that item up to \$14,246,300, in comparison with \$6,660,800 this time last year. In the total reserve there was a gain of \$3,497,800, largely specie; and the small increase of \$487,700 in deposits was due to the contraction of \$3,614,600 in loans. The banks in the last two weeks have added about \$5,600,000 to their surplus reserve, and the currency movement is now running strongly in their favor. Drexel, Morgan & Co., of this city, have been awarded the \$2,500,000 St. Louis 4% city bonds at \$1,017.60 each, a premium of \$17.60 on each bond. The Minnesota Iron Company applies to the New York Stock Exchange to list \$14,000,000 stock.

According to the Custom House report the exports of specie from this port for the week were \$370,840 and the imports \$250,752, making the totals since January 1 \$8,413,000 and \$4,212,900 respectively, as compared with \$7,982,000 and \$4,650,000 for the same time in 1887. Recent sales of securities on foreign account, caused by political agitation in Europe, have brought the rate for sterling bills within a slight fraction of the figures at which gold could be exported profitably. The Bank of England rate remains at 2%, but an advance is spoken of as possible should there be large withdrawals of gold to Uruguay, Brazil and the Continent.

The Erie Canal will not be opened before May 7. On the Welland Canal last year's tolls are renewed.

The Saturday Half-Holiday repeal bill has passed both Houses in the Legislature.

New York.

American Pig.—The week has been a very quiet one in this market, transactions not going beyond jobbing quantities. No further sales are reported by the Thomas Iron Company, although between 40,000 and 50,000 tons can yet be placed. The percentage of Soft Iron made by this leading producer is larger now than it ever has been, and it promises to relieve to some extent the scarcity in the better grades, which has been so prominent a feature in this section for so long a time. There is considerable complaint in the trade that parties having in hand Southern Iron are attempting to push on consumers No. 1 Mill Iron as No. 2 Foundry. This is regarded as a very short-sighted policy, injurious alike to the agent and to his principals. The quantities being sample lots, are usually small, and are beginning to disgust buyers, who are being importuned from many quarters with suggestions to try sample lots of all sorts of Iron. We understand that Southern No. 1 is being offered, delivery at Albany, at \$19 @ \$19.50. We quote here for standard to choice brands of No. 1 Foundry, \$20 @ \$20.50; No. 2, nominally, \$19 @ \$19.50, and Gray Forge, according to quality, \$16 @ \$16.50.

Scotch Pig.—The market is very quiet, with only occasional transactions. We continue to quote: Coltness, \$20.25 @ \$20.50; Summerlee, \$20 @ \$20.25, and Dalmellington, \$18.75 @ \$19; Eglinton, \$18.25 @ \$18.50.

Bessemer Pig.—There has been some inquiry for special grades, and one transaction of 1000 tons for Pittsburgh delivery, at private terms, is reported. Ordinary foreign can be laid down here at \$19.25 @ \$19.50.

Spiegeleisen and Ferromanganese.—There is no demand. German is available at \$26.50 and English 20% at \$27. Ferro is quieter on the prospect of the renewal of operations at the Edgar Thomson works. We quote \$50 for 80%.

Blooms and Billets.—Very little business is being done in foreign, which remain nominally \$30 @ \$30.50. In domestic Nail Slabs the low prices at Pittsburgh and Wheeling are crowding Eastern Pennsylvania works, since Nail works can be reached from the West at about \$30.25 @ \$30.50, delivered.

Wire Rods.—Some business has been done, and there is considerable inquiry. A good many consumers, however, consider prices too high, and are holding off as long as possible. Foreign makers have reduced the price to 105 marks, f.o.b. Antwerp, which is equivalent to 99/6 at works, and, with 13/ freight, figures out about \$40.50. For sailers 10/ is asked, and 8/6 has been paid lately. Importers ask \$40.75 @ \$41 here.

Bar Iron.—We continue to quote: Common 1.65¢ @ 1.7¢; Medium, 1.7¢ @ 1.8¢, and Refined, 1.8¢ @ 1.9¢, in carload lots on dock.

Plates.—We quote: Iron Tank, 2¢ @ 2.10¢; Shell, 2.25¢ @ 2.4¢; Steel Plates, 2.20¢ @ 2.40¢ for Tank; 2 45¢ @ 3¢ for Shell and Flange, and 2.75¢ @ 3.25¢ for Fire-Box.

Steel Rails.—In a quiet way there is very sharp competition for what orders come into this market. Among the latter is a large block from a Southern road. Sales during the past week have not aggregated more than 5000 to 7000 tons by Eastern mills, while from the West come reports of sales aggregating from 15,000 to 20,000 tons. The market both there and here shows a tendency to irregularity and weakness, with quotations remaining nominally \$31 @ \$31.50 for

standard sections at Eastern mill. We hear of a sale to the Pacific Coast of 8000 tons, and there are rumors that the Mexican National have bought about 120,000 tons of English Rails for Mexico.

Old Rails.—We note sales during the week of 700 tons of American Tees, at a point in Pennsylvania, reported at \$22.50, and a lot of 700 tons of Bridges at private terms. Negotiations are pending for about 1800 tons, in two lots. The demand is better and the tone improved.

Scrap.—Scrap is dull and weak, with Selected Domestic offering at \$19, f.o.b. barge.

Philadelphia.

Office of *The Iron Age*, 230 South Fourth St., PHILADELPHIA, PA., April 24, 1888.

Pig Iron.—The market does not appear to have become thoroughly settled yet, although there are indications which point in that direction. Some of the heaviest sellers have placed about all the Iron they care to place for the present, while others are determined to maintain their recent quotations until there are reasons (which do not now appear) for contrary action. There are others, however, who are still looking for a market, and who appear to be at a loss to know what price to quote, and to this class must be attributed whatever blame there may be for the irregularity and unsettled condition of values. It is true that some of the brands are new to the market, and quality being more or less uncertain, prices must necessarily be of the same character. But with such a diversity of prices it is no wonder that buyers are mystified and at a loss to know, until trial is made, whether a low quotation means cheaper Iron or the reverse. A large amount of business has been done, however, and the fact that so much Iron has been taken, and that numerous inquiries are still being made, leads to the impression that if things are not on the bottom they certainly appear to be very near to it. No one looks for higher prices, but there is a strong impression that a halt will be called somewhere near to present figures, and after that a steady business. As regards the local output, it seems to be a little under rather than in excess of consumption. The uncertainty is in regard to the Southern and Western supply. This phase of the subject cannot easily be defined or understood, although it is thought that prices are getting down to a point which will no longer show a margin for profit in shipping to this or other Eastern markets. Still, there are a great many furnaces getting ready for business, and some of them, profit or no profit, will endeavor to force themselves in, so that it may be a little premature to assume that Southern Iron will be withdrawn as soon as it ceases to be profitable. The range of prices seems to be about as follows: Pennsylvania No. 1 Foundry, at tide, choice brands, \$20.50 @ \$21; Standard do., \$20; No. 2 Foundry, \$18.50 @ \$19; Gray Forge, \$16.50 @ \$17; Southern No. 1, delivered in yards, \$19 @ \$20; No. 2, \$17.50 @ \$18; No. 3 ex-ship, \$16 @ \$16.50, with intimations that even \$16 has been shaded for the last mentioned grade.

Foreign Iron.—Some little business has been done in Bessemer, one lot (special brand) having been placed at \$20.25, c.i.f., duty paid. Average qualities are offered at \$19.75, which is above the market at present, although consumers appear to be looking toward foreign markets for supplies to be shipped during the summer and fall months.

Blooms.—Nothing doing in Foreign, although inquiries are frequently made, but prices are too high to permit business under present conditions. Domestic Blooms sell fairly, but there is some

irregularity in prices. Asking rates about as follows: Foreign, at tide, c.i.f., duty paid, \$30 @ \$31 for Nail Slabs; \$31.50 @ \$32.50 for 4 x 4 Billets, and \$35 @ \$39 for Siemens-Martin, price according to analysis, &c. Domestic Blooms: Steel, from \$30 to \$35, f.o.b. cars at mill, according to analysis; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite \$44 @ \$45; Scrap Blooms, \$36 @ \$38 $\frac{1}{2}$ "bloom" ton of 2464 lb.

Muck Bars.—Market extremely dull, and prices inclined to droop. The offerings are quite liberal at from \$28 to \$29 at mill, with sales chiefly at about a medium quotation.

Bar Iron.—It is a long time since things in this line were as dull as they are to-day. Consumption is large, but mills from a distance are so eager for business, and offer their products at such low figures, that it is impossible to meet them. Local mills, therefore, are doing very little apart from their specialties, and half to two-thirds time is more the rule than the exception. Still it is thought that the lateness of the season has had a good deal to do with the dullness, and that with the opening up of the roads, &c., country business will become an important feature. But large orders are scarce at prices likely to be accepted, and prospects are not considered very encouraging. Skelp orders could be had to a moderate extent at about 1.8¢ for Grooved, but on the present basis of cost manufacturers cannot see their way out, and are therefore quoting 1.85¢, without securing anything beyond a few small orders. Bars are hard to quote with any degree of accuracy, as nearly every mill has a price of its own, which may or may not be lived up to. Nominally 1.9¢ is the quotation, but 1.8¢ @ 1.85¢ is far more general and in some cases even the inside figure is shaded for desirable orders, without any immediate indication of a reaction.

Plate and Tank Iron.—We cannot report any improvement in this line, although some of the mills appear to have all the work they can handle. The majority, however, are not nearly so well fixed, half time being about an average with the smaller concerns. Competition is therefore unusually close, and prices at the lowest point touched for a long time. Quotations cannot be given with exactness, as there is no means of knowing what figures would be accepted until an offer is made. Asking prices are about as follows, but on desirable orders concessions would be readily allowed: Ordinary Plate, 2¢ @ 2.10¢; Tank, 2.10¢ @ 2.15¢; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.3¢ @ 2.4¢; Shell, 2.7¢; Flange, 3¢ @ 3½¢; Fire-Box, 3½¢ @ 4½¢.

Structural Iron.—New business does not come in very freely, and mills are beginning to want orders in some of their departments. Most of the leading mills still have a good deal of work under contract, however, so that, with such new business as may be counted on at this season, they are likely to have moderately full employment during the spring and summer months. Prices about as before, say: 2.10¢ @ 2.15¢ for Bridge Plate; 2.10¢ @ 2.20¢ for Angles; 2.7¢ @ 2.8¢ for Tees, and 3.3¢ for Beams and Channels, Iron or Steel.

Steel Rails.—In this market there is very little to report, mills being about full to midsummer, and, as they are maintaining prices at \$31.50 as an inside rate, orders for fall delivery are not being placed. Manufacturers show no disposition to recede from their position, so that the future is an open question, and will probably depend a good deal on the action of the Western mills. Ordinarily \$32 at mill is quoted, but \$31.50 would probably

not be refused for such deliveries as the mills are able to make.

Sheet Iron.—The demand for specialties is fair, and, considering the general outlook, the Sheet Iron trade is doing its full share of business. Galvanized Sheets are very much demoralized, but prices of other descriptions are pretty well maintained, and for small lots may be quoted as follows:

| | |
|--|-----------|
| Best Refined, Nos. 26, 27 and 28.... | 3½¢ |
| Best Refined, Nos. 18 to 25..... | 3¼¢ |
| Common, $\frac{1}{2}$ ¢ less than the above. | |
| Best Bloom Sheets, Nos. 26 to 28.... | 4½¢ @ 4¼¢ |
| Best Bloom Sheets, Nos. 22 to 25.... | 4 @ 4¼¢ |
| Best Bloom Sheets, Nos. 16 to 21.... | 3½¢ @ 3¼¢ |
| Blue Annealed..... | 2.8 @ 3 ¢ |
| Best Bloom, Galvanized, discount..... | .60 % |
| Common, discount..... | .65 % |

Old Rails.—There is some little demand, and as there are no Rails here of any account prices are firmer. Bids of \$21 are made for spot Ts, with a chance of \$21.50 being paid if suitable lots were available, but those in store are held at extreme prices, hence no business can be reported at present.

Scrap Iron.—Very dull, and only small lots and desirable quantities are saleable at quoted rates, which are about as follows: \$20.50 @ \$21 asked for shipments of cargo lots; \$21.50 @ \$22 for carload lots, and choice \$22 @ \$23; No. 2 do., \$14 @ \$15; Turnings, \$15 @ \$16; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$16 @ \$17; do. Borings, \$11 @ \$12; Old Fish Plates, \$26 @ \$27. Old Car-Wheels, \$17.50 @ \$18, Philadelphia, or its equivalent.

Wrought-Iron Pipe.—There is not much change to notice this week, although what little there is in the direction of improvement. Small sizes are in good demand, and from the number of inquiries coming in continued activity is looked for. Discounts in ordinary transactions are about as follows: Black Butt-Welded, 50%; on Galvanized do., 45%; on Black Lap-Welded, 65%; on Galvanized do., 50%; Boiler Tubes, 60%.

Nails.—The market does not improve to any extent, although at this season a good deal of activity is expected. Prices are very irregular, but lots from store are quoted \$2.10 @ \$2.15, with the usual concessions on carload lots.

The Sheridan Furnace, at Topton, Pa., was put in blast a few days ago, and is working very successfully. Mr. J. J. Mohr, the sales agent, informs us that a great deal of new machinery and other improvements have been added, and that they expect to turn out a finer quality of Iron than ever before.

The old firm of Morris, Tasker & Co., Limited, have been succeeded by a chartered company, under the title of Morris, Tasker & Co., Incorporated. The company have organized, with Stephen P. M. Tasker, Andrew Wheeler, Morton C. McIlvain, William R. McIlvain and Jonathan Rowland as directors, and the officers of the company are Andrew Wheeler, president; Jonathan Rowland, vice-president; T. Wistar Brown, treasurer, and H. C. Van Sant, secretary, and Stephen P. M. Tasker will, as heretofore, act as general consulting engineer. The company will operate both the Pascal Iron Works, Philadelphia, and the Delaware Iron Works, at New Castle, Del. The Pascal Iron Works occupies an entire block, bounded by Fourth and Fifth, Morris and Tasker streets, and its products include Pipe Fittings, Valves, Gas Machinery and many other specialties, which have always maintained a high standard in the trade. The Delaware Iron Works, at New Castle, Del., have unexcelled facilities for the manufacture of Boiler Tubes and Wrought-Iron Pipe of large diameters. The offices of Morris, Tasker & Co., Incorporated, are

at 224 South Third street, Philadelphia, where all communications relating to either works should be addressed.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington St., Chicago, April 23, 1888.

Business has been very quiet during the past week, and there is a noticeable change in the hopeful tone which was apparent in many quarters but a short time since. The outlook continues to appear more unpromising, especially in the branches of trade which are directly connected with railroads. The influence of the diminishing business in these lines permeates the whole trade and seems to grow stronger every week.

Pig Iron.—Trade generally has been very dull. The sales reported are of low grade or inferior Irons, which are to be had at prices that would have been deemed absurd at the beginning of the year. Consumption is decreasing and there seems to be no hope of relief or of a change in the condition of affairs until production is greatly curtailed. Parties who are in the market for even small quantities of Iron are shopping vigorously to get bargains. Coke Irons have hitherto been the weakest in the list, but Charcoal Irons are now following suit, and although some of the standard makes are held at old rates others are available at less than our quotations. There has been a little more weakness in American Scotch, but in the absence of business prices have been but slightly affected. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Charcoal, all numbers, \$20 @ \$20.50; Alabama Car-Wheel, \$27; Southern Charcoal Foundry, No. 1, \$19.50 @ \$20.50; Jackson County Softeners, No. 1, \$19 @ \$20; Hocking Valley, Soft Foundry, No. 1, \$18.50 @ \$19; American Scotch, No. 1, \$19.50 @ \$20.50; Ohio Scotch, No. 1, \$18 @ \$19; Lake Superior Coke, No. 1, \$18.50 @ \$19; No. 2, \$17.50 @ \$18; No. 3, \$16 @ \$16.50; Southern Coke, No. 2, \$17.50 @ \$18; No. 2½ and Open Bright, \$17 @ \$17.50; No. 3, \$16.50; No. 1 Mill, \$16.25; No. 2 Mill, \$15.75.

Bar Iron.—Some car orders have been placed, and a few concerns have been able to get a little better business in this way, but the others have found trade very dull indeed. The usual price for good Common Iron is still about 1.70¢, half extras, f.o.b. Chicago, but lower quotations are being made by some mills. The fact is noted, however, that the prices made by the lowest sellers do not in all cases cover a full assortment. They are only prepared to furnish a limited line of sizes. This is a point which buyers need to keep in mind. Store prices still range from 1.80¢ to 2.10¢, according to quantity and quality.

Structural Iron.—Business has been very quiet in this line, although inquiries in hand point to a considerable volume of trade later in the season. Angles are now quoted at 2.50¢ @ 2.70¢, Tees at 2.70¢ @ 2.90¢, and Beams and Channels, at 3.80¢, from store. In carload lots Angles are still quoted at 2.25¢, Tees at 2.55¢, Beams at 3.40¢, and Universal Plates, 2.35¢, f.o.b. Chicago, from mill. The Beam Association have fixed prices for the season at the rates now ruling.

Sheet Iron.—Inquiries from large buyers are still in the market, but most of them are for lots deliverable far into the autumn, which the mills still hesitate to consider. A limited business has been done by some mills for early shipment at rates a shade under current quotations, which are 2.95¢ @ 3¢, f.o.b., Chicago, for No. 27 Common Black. The jobbers report store prices a little weaker. They are now quoting 3.30¢ from store for No. 27.

The demand for Galvanized Iron has been fair, but by no means equal to the average of the past month. Quotations continue at 60% off for Juniata and 60% and 5% off for Charcoal in small lots.

Plates, Tubes, &c.—Business has been very quiet, but a great deal of new work is in sight, and the general situation is slightly more encouraging. Quotations continue as follows from store: Heavy Sheets, Nos. 10 to 14, 2.70¢; Tank Iron, 2.60¢ @ 2.70¢; Tank Steel, 2.75¢ @ 3¢; Shell Iron, 3¢; Shell Steel, 3¢ @ 3.25¢; Flange Iron and Steel, 4¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢; Boiler Tubes, 60% @ 62½% off on 2½ inch and larger, and 57½% off on 2 inch and smaller.

Merchant Steel.—A fair store trade is reported by the local dealers, with very little inquiry from large buyers. Quotations from store are as follows: Bessemer Bars, 2.45¢; Tool Steel, 8½¢ @ 9½¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.25¢; Open-Hearth Spring, 2.90¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 11¢.

Steel Rails.—Some sales have been made since our last report, but the business done has not been large. Quite a number of inquiries are in the market, but buyers are very slow to close. The local manufacturers fear that the predictions of a large year's business in building new railroads will not be realized, as the condition of the leading Western roads is far from satisfactory. Another freight war is impending and if it is precipitated it will probably be more bitter than the one just ended. Quotations are still somewhat uncertain, \$33 at mill being the rate which manufacturers are trying to get for purely local business, while this price would be shaded in case a large order were to appear.

Old Rails and Wheels.—The Old Rail market is irregular. Sales are reported at equal to \$21.25, Chicago, while, on the other hand, large consumers state that they are not prepared to offer over \$20. No Rails are known to have been sold for Chicago delivery. For one lot \$20.50 was bid and refused. Old Car-Wheels are weaker, in sympathy with Lake Superior Charcoal Iron, and consumers are not willing to give over \$19.50, but at the same time the supply is very limited, and it is not likely that they could purchase a considerable quantity at this price.

Scrap.—The local dealers report a very dull week. The railroad companies and consumers have recently arranged most of the Scrap transactions in this vicinity directly with each other, so that it is difficult to get at the terms on which actual sales have been made. One large lot of Railroad Shop, or No. 1 Forge, however, was sold at \$18, and another lot of mixed Shop and Track brought the same price. Dealers still offer \$12 @ \$13 for Mixed Country Scrap. Dealers' selling quotations of carefully selected are as follows: 20 ton of 2000 lb: Railroad Shop or No. 1 Forge, \$19 @ \$19.50; Track, \$17.50 @ \$18; No. 1 Mill, \$13.50 @ \$14; Light Wrought, \$8.50 @ \$9.50; Horseshoes, \$19; Axles, \$25; Machinery, Cast, \$15 @ \$15.50; Stove Plate, \$12; Cast Borings, \$9.50; Wrought Turnings, \$12; Axle Turnings, \$13; Coil Steel, \$14; Leaf Steel, \$15.50; Locomotive Tires, \$16.50.

General Hardware.—Manufacturers' agents report very dull trade. Prices are weak on many lines of goods unsupported by tight combinations, but they have not yet given way, although there are indications that this may soon happen if the demand does not revive through some other influence. Such a policy is condemned by leading members of the trade,

who recognize the fact that some time should be allowed for the large stocks in dealers' hands to be worked off. They argue that it would merely destroy the profit now being realized on small orders, while it would not induce heavy buying. Jobbers of Shelf Hardware report a good general trade, but a light demand for staple articles. Nails and Barb Wire are only moving in small lots. As compared with previous years the condition of this branch of trade is normal for the season. Collections are now somewhat slow, but this is quite natural in view of the fact that many retail merchants were induced by low freight rates to buy goods before they were actually needed, so that they cannot pay with their usual promptness.

Nails.—Manufacturers' agents are making very light sales and have plenty of time to discuss two topics of present interest—the new Nail card of extras and the probable time required for the dealers to work off their large stocks. Nothing was done last week by representatives of Wire Nail factories, pending the action to be taken at the meeting of the manufacturers in New York. Jobbers quote small lots of Steel Cut Nails at \$2.15 and carload lots at \$2.10; small lots of Wire Nails at \$2.85 and carload lots at \$2.75.

Barb Wire.—Some of the manufacturers are still in receipt of good orders for delivery in the far West, but the near-by trade has been pretty well stocked. The Barb-Wire Manufacturers' Association, at their meeting here on the 18th inst., reaffirmed their carload price of 3.25¢ for Painted, resolved to close their mills from July 1st to August 15th, inclusive, and decided to use every effort to induce jobbers to co-operate with them in maintaining prices at the rate named. The local jobbing trade express their willingness to meet the wishes of the manufacturers, provided the jobbers elsewhere can be prevailed upon to do the same. For the present they quote Painted at 3.15¢ @ 3.20¢, in small lots, with a concession for carloads and ¼¢ extra for Galvanized, but the duration of this quotation is uncertain under the circumstances.

Pig Lead.—It is rumored that transactions aggregating 500 tons of Common have taken place at 4.5¢, spot and May. Consumers have fair stocks, but the manufacturers of White Lead have recently been making inquiries. Trade in manufactured products is steadily improving.

Copper.—A continued good demand for Sheet is reported at 25¢ rates.

H. R. Durkee & Co., 115 Dearborn street, Chicago, have recently been re-appointed exclusive sales agents for the Northwest of Hubbard Scotch Pig Iron, made by Andrews & Hitchcock's Hubbard Furnaces, at Hubbard, near Youngstown, Ohio. For the past year this Iron has been sold by another firm, who have withdrawn from this field. The Hubbard is one of the leading American Scotch brands, made from Blackband Ores.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth avenue, Pittsburgh, Pa., April 24, 1888.

The general industrial situation continues in an unsettled and unsatisfactory condition, and the outlook is not as encouraging for an immediate improvement as it might be. The Edgar Thomson Steel Works, which have been idle for about four months, were started up yesterday independent of the Knights of Labor, and the company expect to be in full blast within a couple of weeks. The Knights predict that the movement will prove a failure, but the company, after having given the matter a good deal of considera-

tion, have resolved to make the attempt, and are prepared to take the chances. There is a principle involved, and the company are determined to ascertain whether they or the men are going to operate the works. The Edgar Thomson Works, when in full blast, employ over 3000 men.

Pig Iron.—There has been no important change in the situation during the past week. Business continues light for the season, and the outlook for an early substantial improvement is not very encouraging. Reports from nearly all points are of a discouraging character, demand light and prices irregular and unremunerative. It is evident that the cost of production must be further reduced. Coke and Ore are lower and freight rates on Coke have been reduced, but furnacemen demand lower freight rates on Pig Iron, and the indications are that the demand will soon be complied with. With some of the furnaces just now the most important matter is that of transportation. Upon it hinges largely whether they are to continue in blast or blow out. Prices may be quoted as follows:

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| Neutral Gray Forge..... | \$15.25 @ | \$15.75, 4 mos |
| All Ore Mill..... | 16.50 @ | 16.75 " |
| White and Mottled..... | 15.25 @ | 15.50 " |
| No. 1 Foundry..... | 17.50 @ | 18.00 " |
| No. 2 Foundry..... | 16.50 @ | 17.00 " |
| No. 3 Foundry..... | 16.00 @ | 16.25 " |
| No. 1 Charcoal Foundry..... | 24.50 @ | 25.00 " |
| Cold Blast Charcoal..... | 26.00 @ | 28.00 " |
| Bessemer Iron..... | 17.00 @ | 17.25 cash. |

Rumors prevail of sales of Bessemer having been made for May delivery at \$16.65 to \$16.75, cash, but as yet these rumors are not well authenticated. Indeed, it is suspected that bogus sales are being reported for the purpose of "bearing" the market. The last sale of Bessemer reported was a lot of 2000 tons at \$17.25, cash, but it is probable that it can now be bought at \$17, cash.

Muck Bar.—There has been no further change in prices, which we continue to quote at \$26.50 @ \$27, cash. It is claimed that there is no margin for profit at present prices, and some mill owners say that their only reason for making sales is to keep their mills in operation and their men together. The margin is smaller than it has been for years.

Manufactured Iron.—Trade continues light for the season, and but few of the mills are running full; prices continue weak. Buyers, almost without exception, are buying only for their immediate needs. We continue to quote prices upon a basis of 1.75¢ @ 1.85¢ for Bars, 60 days, 2% off for cash.

Nails.—There is no improvement to note in the Nail trade; orders continue to come forward very sparingly, and the few mills here in operation are not working up to anything like their full capacity. No change in prices, which we continue to quote at \$1.90, 60 days, 2 per cent. off for cash. There is some opposition being developed to the change made at the last meeting of the Western Association in the classification, notwithstanding it does not go into effect until the 1st of June.

Wrought-Iron Pipe.—This important branch of the Iron business continues in a most unsatisfactory condition; while the demand is improving somewhat, it is still considerably below what it was a year ago, and then it is well to bear in mind that the Pipe-making capacity has been considerably increased in the meantime. The market continues in an unsettled condition, and prices have been cut to such an extent that some manufacturers are not soliciting business, claiming that the prices obtainable do not cover actual cost of production. So far as we can learn there have been no large contracts made since the one given out by the Standard Oil Company a month or more ago. The natural gas companies will commence putting down Pipe in the

cities on May 1, not being allowed to tear up the streets before that time, and there may then be an increased demand, although the indications are there will not be as much Pipe required by the gas companies this year as last. So far as we can learn there is no effort being made to reorganize the Wrought-Iron Pipe Association, and until it is reorganized there is not likely to be anything like uniform prices.

Old Rails.—There is considerable of inquiry for American Tees, with but few offering; the last sales reported were at \$23 @ \$23.25, although consumers say they can now buy below the prices quoted.

Steel Rails.—Are still quoted at \$31.50 @ \$32, cash, on cars at mill. The Edgar Thomson Works, after standing idle for four months, have been started up again.

Merchant Steel.—Best brands of Tool Steel, 8½¢ @ 1¢; Crucible Spring Steel, 4½¢; Crucible Machinery, 5¢; Open-Hearth Machinery, 2½¢.

Billets, &c.—Bessemer Steel Billets may be quoted at \$28.50, cash, at sellers' works. Sales of American Wire Rods reported at \$41, cash; Domestic Rail Ends quotable at \$18, cash. No sales reported recently.

Railway Track Supplies.—Railway Spikes are quotable at \$2 @ \$2.25, 30 days, delivered. It appears that the combination is broken. Splice Bars, \$1.80 @ \$1.90; Track Bolts, \$2.90 with square, and \$3 with hexagon Nuts.

Old Material.—There is inquiry for No. 1 Wrought Scrap, which may be quoted as steady at \$20 for Railway Shop; Wrought Turnings, \$13 @ \$13.50; Car Axles, \$24.50 @ \$25; Cast Borings, \$11.50 @ \$12, gross; Cast Scrap, \$16.50 @ \$17; Old Car-Wheels, \$20, gross.

Cleveland.

CLEVELAND, April 23, 1888.

Iron Ore.—Rumors of stupendous transactions are numerous, but when traced to their source are found to be wholly unreliable. A single, unimportant transaction has occurred, the agents in this city of the Lake Angeline Mining Company having made arrangements to deliver about 50,000 tons of Ore to the Isabella Furnace Company, Loughlin & Co., Carnegie Bros. & Co. and the Union Steel Company, of Chicago. The Isabella Furnace Company and Loughlin & Co. are stockholders in the Lake Angeline Mine. The Ore is a specialty and the sale, which was at private terms, is no indication of an opening market. The Republic has fixed its price at \$6.00 and has made some sales; the Chapin has named \$5 and the Minnesota Iron Company \$5.75 for Vermillion Ore. A few single-trip charters from Marquette to Lake Erie ports, at \$1.25, have been made and vessels have offered to bring down Ore from Escanaba at \$1. About 10 or 12 vessels are included in the Ashland charters, at \$1.25, as reported last week. This is the rate to which the mine owners have insisted that lake freights must come before charters were made. A contract has been made between a local shipper and certain vesselmen to bring 75,000 tons of Ore from Marquette, at \$1.15, and 25,000 tons from Escanaba, at \$1. The vesselmen claim that the tonnage which will carry this Ore is under the control of the shippers themselves. It is now asserted that charters have been made with several vessels for ten trips each, from Two Harbors, from where the output of the Minnesota mines is shipped, at \$1.25 per ton. The result of the charters acknowledged to have been made will probably be several round sales within the next ten days or two weeks. The furnacemen are, however, making no offers. They are in no hurry to make

purchases. Nearly 30,000 tons of last season's Ore on the docks have been forwarded to the furnaces during the past week, shippers being desirous of making room for new material. Special efforts are being made to establish a basis for sales of Gogebic Ore. Last season's quotations were \$5.50 @ \$6 for Bessemer quality. It is believed that \$4.75 @ \$5.25 will be the minimum and maximum prices for Gogebic Ore this year. Several small lots of last season's Ore have been sold during the week. Selling prices are approximately as follows:

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| No. 1 Specular and Magnetic Ores, Bessemer quality..... | \$6.00 @ \$6.35 |
| No. 1 Specular and Magnetic Ores, Non-Bessemer quality..... | 5.25 @ 5.50 |
| Red Hematite Ores, Bessemer quality..... | 5.15 @ 5.40 |
| Red Hematite Ores, Non-Bessemer quality..... | 4.00 @ 5.00 |
| Menominee Range Ores, Bessemer quality..... | 5.15 @ 5.40 |
| Menominee Range Ores, Non-Bessemer quality..... | 4.25 @ 4.50 |
| Gogebic Range Ores, Bessemer quality..... | 5.00 @ 5.50 |

Pig Iron.—Sales of Pig Iron are confined to carload lots. Lack of confidence on the part of buyers seems to be responsible for the present dullness, although a few round orders, such as were being placed last season at this time, from the railways, would strengthen the market. Of the 54 furnaces, with a weekly capacity of 34,912 tons, in the Mahoning and Shenango valleys and Northwestern Ohio, which control the local market, 20 furnaces, with a capacity of 10,522 tons per week, are out of blast. The following are f.o.b., cash, quotations:

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| Nos. 1 to 6 Lake Superior Charcoal..... | \$21.50 @ \$22.50 |
| No. 1 Strong Foundry, Bessemer quality, ½ ton..... | 18.50 @ 19.00 |
| No. 1 Strong Foundry, ½ ton..... | 11.50 @ 18.50 |
| No. 2 Strong Foundry, ½ ton..... | 16.50 @ 17.50 |
| No. 1 American Scotch, ½ ton..... | 18.85 @ 19.35 |
| No. 2 American Scotch, ½ ton..... | 17.35 @ 18.35 |
| No. 1 Soft Silvery, ½ ton..... | 18.50 @ 19.50 |
| Mahoning and Shenango Valley Neutral Mill Irons, ½ ton..... | 15.50 @ 15.75 |
| Mahoning and Shenango Valley Red and Short Mills, per ton..... | 16.00 @ 16.35 |

Old Rails.—The market is dull, a few hundred tons of Old Americans, at \$21.50 @ \$21.75, being about the only sales reported. Old Wheels are dull at \$20.50.

Nails.—Iron Nails are still in good demand at \$2, and Steel Nails at \$2.10. Steel Wire Nails are quoted at \$2.75 from store.

Chattanooga.

Office of The Iron Age, Carter and Ninth Sts., CHATTANOOGA, TENN., April 23, 1888.

Pig Iron.—While the general tone of the market has been quiet, yet it has shown a very conservative, in some respects a strong, disposition to somewhat react from the low prices at which some sales have been made. Especially does this apply to the best grades of Foundry Irons, which are decidedly scarce and hard to get. Should this condition of things continue there must be an advance in this class of Iron, although it is, of course, impossible to tell what the quality of the output of the new furnaces will be that are about to go in blast. In spite of the efforts of the managers, many of the stacks have persisted in putting out inferior grades, which are offered on the market and which have the tendency to keep prices down, but with all that the future has not the discouraging aspect that prevailed a few weeks ago. It is true inquiries are more for smaller lots than they used to be, but come much oftener and are scattered all over the country. The Southern furnaces that have maintained a uniform good grade, and one that has satisfied consumers, are selling their output at good paying prices and are not at all apprehensive of the future, while those that have persisted in making uneven grades, running White, Mottled, Silvery and light Foundries, are obliged to canvass around a good deal to find a market for their products, and in ad-

dition to this are stocking up a good deal in their yards and frequently make low prices in order to unload. Prices range at the furnaces for best Foundry grades \$14.50 to \$16, according to quality, and there are no stocks accumulating at any of the yards of this kind of Iron. The three principal lines of railroad that lead north from the Southern Pig Iron producing districts are pursuing a far-seeing policy in reference to freights, and are governing themselves accordingly. Freights will be reduced May 1st 20¢ per ton from the prices that went into effect first of this month, and such is the arrangement now existing that there is not a furnace in the South but can quote prices delivered to any consumer in the United States and many points in Canada.

Detroit.

WILLIAM F. JARVIS & Co., Pig-Iron merchants, Detroit, report as follows under date of April 23: Notwithstanding the fact that some large blocks of Lake Superior Charcoal Iron have been disposed of, the market still remains unsatisfactory. The majority of buyers still seem determined to put off placing orders as long as possible, and this causes prices to continue in an unsettled state. As charters are being made at \$1.40 on Ore from Marquette and \$1.25 from Ashland to Ohio ports, and in some cases it is claimed that even these prices are being shaded, it is evident that the vesselmen have at last weakened. With the volume of business about up to the average, we quote as follows:

| | |
|--|-------------------|
| Lake Superior Charcoal, all numbers..... | \$20.50 @ \$21.50 |
| Lake Superior Coke, All Ore..... | 20.00 @ 20.50 |
| Lake Superior Coke, Cinder Mixed..... | 19.00 @ 19.50 |
| Standard Ohio Blackband..... | 20.00 @ 20.50 |
| Southern No. 2..... | 18.50 @ 19.00 |
| Southern Silvery..... | 18.50 @ 19.00 |
| Jackson County, Ohio, Silvery..... | 21.00 @ 20.50 |
| American Old Iron Rails..... | 23.00 @ 25.00 |
| Old Wheels..... | 20.75 @ 21.25 |

Louisville.

LOUISVILLE, KY., April 22, 1888.

Pig Iron.—There is very little change in the market. A portion of the buyers are holding off, believing they will be able to name their own figures, while others are making purchases for long deliveries, believing that the price of Iron is low enough and don't desire to run the risk of having to pay more. The report that other furnaces will soon blow in is causing some uneasiness, but large buyers believe that the lack of fuel and Ore will prevent them from making much Iron during the present year. There have been very few sales, and mostly from hand to mouth. Old Wheels have sold on basis of \$19, Louisville, and Old Rails basis of \$21.

| | |
|---|-------------------|
| Southern Coke, No. 1 Foundry..... | \$18.25 @ \$19.25 |
| " No. 2..... | 17.25 @ 18.25 |
| " No. 2½..... | 16.75 @ 17.75 |
| Hanging Rock Coke, No. 1 Foundry..... | 18.75 @ 19.75 |
| Hanging Rock Charcoal, No. 1 Foundry..... | 22.25 @ 23.75 |
| Southern Charcoal, No. 1 Foundry..... | 19.35 @ 21.75 |
| Silver Gray, different grades..... | 15.75 @ 16.75 |
| Southern Coke, No. 1 Mill, Neutral..... | 15.75 @ 16.75 |
| " No. 2..... | 15.25 @ 16.25 |
| " No. 1 " Cold Short..... | 15.25 @ 16.25 |
| White and Mottled, different grades..... | 14.75 @ 15.75 |
| Southern Car-Wheel, standard brands..... | 21.75 @ 22.75 |
| Southern Car-Wheel other brands..... | 19.75 @ 21.75 |
| Hanging Rock, Cold Blast..... | 22.75 @ 24.75 |
| Hanging Rock, Warm Blast..... | 19.75 @ 20.75 |

Cincinnati.

Office of The Iron Age, Fourth and Main Sts., CINCINNATI, April 23, 1888.

Pig Iron.—The local market for Pig Iron during the past week has been dull and featureless, and prices have continued to favor buyers rather than sellers. No figures of statistical value regarding the trade have been made public, and no new developments of interest have been made here. If the large sales pending at our

Coal Market.

The Anthracite Coal market is quiet, but confidence is felt that more activity will prevail after May 1, when navigation is opened to all points by lake and canal, although from present indications the spring movement will be later than usual. The Erie canal will not open before May 7, as delay is experienced in completing the new locks. In the Eastern trade there is more disposition to avail themselves of the present easy condition of the market. The several companies claim to be standing solid against concession in prices, but individuals do not hesitate to cut in order to secure a customer. As the Reading Company are no longer in the impecunious condition of former years, they will not feel compelled to slaughter their product to obtain ready cash, thus removing the chance for "bargains," which formerly operated to encourage tardy buyers. Despite this fact, the hold-off policy is characteristic of the times.

Spring prices are as follows: Wyoming Free Burning, f.o.b. at South Amboy and Weehawken, Broken or Grate, \$3.75; Egg, \$4; Stove and Chestnut, \$4.25. Reading Hard White Ash, at Port Elizabeth, Lump and Steamboat, \$4.25; Broken, \$4; Egg, \$4.10; Stove, \$4.25; Chestnut, \$4.15; Pea, \$3. Free Burning White Ash is the same, except Broken, \$3.75, and Egg, \$4. Lehigh Coals are for Lump, \$4.50; Broken, \$4.20; Egg, Stove and Chestnut, \$4.10 per ton, f.o.b. at the loading ports.

The Anthracite Coal production at the mines is held pretty steadily from week to week, with little variation in the aggregate output. The comparison for three weeks ended 21st inst. is as follows:

| | Year | |
|---------------|---------|-----------|
| April 7..... | 667,869 | 8,414,000 |
| April 14..... | 707,627 | 9,251,000 |
| April 21..... | 683,549 | 9,865,000 |

The aggregate since January 1 shows an increase of 40,000 compared with the same time in 1887. The Lehigh region increased 18,000 tons as compared with the previous week, while the Wyoming dropped 18,000 tons and the Schuylkill 25,000 tons. The accumulation at tide-water points is reported to be not far from 500,000 tons. The Pennsylvania Railroad Company has increased its tonnage this year 395,000 tons. The Reading shipped last week 150,000 tons, of which 45,000 tons were sent to Port Richmond and 15,000 to Elizabethport.

Bituminous Coal is quiet. In regard to prices the Boston *Commercial Bulletin* says: "One or more Cumberland shippers outside of the pool are undoubtedly cutting prices, and several of their Clearfield competitors are doing likewise. The pool which worked so well all last season seems rapidly to be falling into desuetude, and not so very innocuous, either. The cutting appears to be done by making delivered contracts outright and by shading f.o.b. prices. As almost all the contracts made on a basis of \$2.60 f.o.b. contain a 'protection clause' to the effect that the buyer may cancel the contract and buy elsewhere if the lowest subsequent prices are not met, there is every inducement for buyers to break the pool."

The Western Anthracite Committee adopted as the opening prices for this season \$4.25 per gross ton for Grate and Egg, \$4.50 for Stove and Chestnut, on cars at Buffalo; for Coal f.o.b. vessel the rates are 30 cents per ton additional, an advance of 5 cents per ton over the opening price of last year.

A meeting of the trade in this city today made no change.

Imports.

The imports of Iron and Steel, Hardware, &c., at this port from April 13 to April 21, inclusive, and from January 1 to April 21, inclusive, were as follows:

Iron and Steel.

| | April 13 to April 21. | Jan. 1 to April 21. |
|--|-----------------------|---------------------|
| | Tons. | Tons. |
| Iron Ore: A. Earnshaw..... | 296 | 4,021 |
| Pig Iron: G. W. Stetson & Co..... | 500 | 6,530 |
| Crocker Bros..... | 100 | 3,100 |
| N. S. Bartlett..... | 100 | 2,000 |
| Henderson Bros..... | 65 | 775 |
| C. V. Philp..... | 50 | 50 |
| Spiegelisen: Crocker Bros..... | 460 | 1,134 |
| J. A. Jansen..... | 300 | 9,812 |
| Naylor & Co..... | 250 | 1,540 |
| J. Abbott & Co..... | 200 | 250 |
| Jas. Arkell & Co..... | 28 | 28 |
| Steel: W. F. Wagner..... | 23 | 449 |
| R. H. Wolf & Co..... | 12 | 212 |
| F. S. Pidditch..... | 11 | 125 |
| M. Cohn & Co..... | 8 | 158 |
| Chas. Hugill..... | 7 | 83 |
| C. F. Boker..... | 6 | 35 |
| C. A. Walschid..... | 5 | 15 |
| C. W. Power..... | 2½ | 21 |
| R. F. Downing & Co..... | 2 | 108 |
| Steel Rods: J. Abbott & Co..... | 681 | 2,634 |
| Naylor & Co..... | 150 | 4,738 |
| R. H. Wolf & Co..... | 90 | 1,290 |
| Sanderson & Son..... | 67 | 67 |
| Steel Sheets: C. S. Mersick & Co..... | 90 | 127 |
| Naylor & Co..... | 49 | 280 |
| Pierson & Co..... | 48 | 345 |
| Steel Plates: W. H. Wallace & Co..... | 10 | 10 |
| Steel Bars: A. Milne & Co..... | 1 | 186 |
| Steel Slabs: A. Milne & Co..... | 27 | 27 |
| Steel Forgings: Thos. Prosser & Son..... | 30 | 1,602 |
| Steel Blooms: W. H. Walbaum & Co..... | 325 | 861 |
| Steel Strips: Naylor & Co..... | 20½ | 20½ |
| Charcoal Iron: Naylor & Co..... | 25 | 50 |
| Sanderson & Son..... | 1 | 1 |
| Steel Wire: T. B. Coddington & Co..... | 11 | 11 |
| Swedish Rough Bars: C. V. Philp..... | 50 | 50 |
| Ferromanganese: C. L. Perkins..... | 941 | 1,950 |
| Sheet Iron: T. B. Coddington & Co..... | 80 | 451 |
| Swedish Bar Iron: C. V. Philp..... | 20 | 88 |
| Rivet Rods: J. A. Roebbling's Sons..... | 60 | 60 |
| Swedish Iron: R. F. Downing & Co..... | 50 | 50 |
| Boiler Tubes: Merchant's Despatch..... | 30 | 30 |
| Iron Pipe: W. H. Wallace & Co..... | 4 | 50 |
| Tubes: J. S. Leng & Co..... | 4 | 10 |

Tin Plates.

| | Boxes. | Boxes. |
|----------------------------------|--------|---------|
| Phelps, Dodge & Co..... | 9,763 | 147,514 |
| Pratt Mfg. Company..... | 8,480 | 48,722 |
| Dickerson, Van Dusen & Co..... | 6,221 | 80,878 |
| T. B. Coddington & Co..... | 3,287 | 46,213 |
| A. A. Thomson & Co..... | 2,372 | 36,167 |
| N. L. Cort & Co..... | 1,694 | 29,655 |
| R. Crooks & Co..... | 1,106 | 24,367 |
| Jas. Byrne & Son..... | 1,000 | 11,723 |
| Wolf & Roeding..... | 882 | 12,139 |
| Bruce & Cook..... | 830 | 22,296 |
| | Boxes. | Boxes. |
| Taggers: Phelps, Dodge & Co..... | 255 | 255 |
| R. Crooks & Co..... | 183 | 183 |
| T. B. Coddington & Co..... | 160 | 160 |

Metals.

| | Pounds. | Pounds. |
|-------------------------------------|---------|-----------|
| Tin: J. Abbott & Co..... | 707,364 | 6,330,854 |
| Muller, Schall & Co..... | 221,995 | 804,053 |
| Naylor & Co..... | 14,214 | 702,628 |
| Hendricks Bros..... | 13,819 | 224,182 |
| Spelter: Naylor & Co..... | 55,118 | 109,238 |
| Nickel: McCoy & Sanders..... | 10,060 | 76,906 |
| Sheet Zinc: H. Lemarche's Sons..... | 2,059 | 2,059 |
| | Casks. | Casks. |
| Antimony: Edw. Hill's Sons..... | 100 | 675 |

Hardware, Machinery, &c.

| | |
|---|--|
| Baldwin, Austin, Mach'y, pkgs., 15 | |
| Boker, Carl F., Mdse., cs., 24 | |
| Boker, Hermann & Co., Nails, cs., 2; Mdse., cs., 5 | |
| Beaver, Louis C., Mach'y, cs., 4 | |
| Clark, G. A. & Bro., Mach'y, cs., 4 | |
| Duncan's Son, John, Oil Stoves, 300 | |
| Farnley Iron Company, Clay Tubs, &c., 35 | |
| Fedde, Gabriel, Fog Horns, cs., 10 | |
| Field, Alfred, & Co., Cutlery, cs., 11; Hardware, pkgs., 1 | |
| Fudridge, Sam, & Co., Arms, cs., 1 | |
| Foley, Edward, Mach'y, cs., 2 | |
| Graef Cutlery Co., Cutlery, cs., 7 | |
| Gurney, F. B., Mdse., cs., 2 | |
| Hartley & Graham, Arms, cs., 10; Mdse., cs., 2 | |
| Junge F. W. & Co., Mach'y, pkgs., 62 | |
| Meacham Arms Company, Arms, cs., 12 | |
| Newton & Shipman, Files, cs., 3 | |
| Pratt & Farmer, Hardware, cs., 10 | |
| Putney, Daniel Gun Barrels, cs., 5 | |
| Sellers, W. B., Cutlery, cs., 4 | |
| Squires, H. C., Cartridges, cs., 40 | |
| Sumner, C. P., & Co., Mach'y, cs., 1 | |
| Taylor, Thos., Mdse., cs., 8 | |
| Ward, Asline, Mdse., cs., 4; Cutlery, cs., 4 | |
| Wiebusch & Hilger, Lim., Chains, cs., 25; Hdw., pkgs., 4; Mdse., cs., 3 | |
| Order: Mach'y, cs., 42; Hardware, cs., 1 | |

Iron and Metals Warehoused From April 13 to April 21, Inclusive.

| | Tons. |
|-------------------------------------|--------|
| Steel Tires: Page, Newell & Co..... | 10 |
| Swedish Bar Iron: C. V. Philp..... | 20 |
| | Casks. |
| Antimony: Edw. Hill's Sons..... | 100 |

Exports of Metals.

| | April 13 to April 21. | Jan. 1 to April 21. |
|---------------------------------------|-----------------------|---------------------|
| | Pounds. | Pounds. |
| Copper: J. Abbott & Co..... | 302,840 | 3,737,859 |
| Lewisohn Bros..... | 151,000 | 3,629,749 |
| F. A. Lomal..... | 111,116 | 2,581,293 |
| American Metal Co..... | 112,000 | 3,204,103 |
| G. H. Nichols..... | 560,000 | 111,116 |
| J. Bruce Ismay..... | 108,176 | 112,000 |
| S. Mendel..... | 110,276 | 230,664 |
| Ledoux & Co..... | 490,000 | 234,034 |
| Phelps, Dodge & Co..... | 112,026 | 1,250 |
| Muller, Schall & Co..... | 1,250 | 224,881 |
| Copper Queen Con. M. Co..... | 115,790 | 125,000 |
| J. Kenn-dy, Tod & Co..... | 67,500 | 765,880 |
| H. Beecher & Co..... | 250,000 | 67,500 |
| Orford C. & S. Rfg. Co..... | 250,000 | 112,000 |
| Robt. M. Thompson..... | 1,719,428 | 250,000 |
| Thos. J. Pope, Sons & Co..... | 18,978,237 | 2,953,390 |
| J. Parsons & Co..... | 2,953,390 | 519,485 |
| Bridgeport Copper Co..... | 295,000 | 295,000 |
| C. Herold..... | 458,800 | 184,288 |
| Copper Matte: Williams & Terhune..... | 170,853 | 499,812 |
| Lewisohn Bros..... | | |
| American Metal Company..... | | |
| J. Abbott & Co..... | | |
| C. Ledoux & Co..... | | |
| F. W. J. Hurst..... | | |
| G. H. Nichols..... | | |

The Wallaroo copper mines in Australia produced in 1887 as much as 5981 tons of copper at a profit of £40,071, of which £30,535 is due to increased valuation of stocks of ore required to carry on the business. A plan is being considered to amalgamate the Wallaroo and Moonta properties.

The Conkling iron ore concentrator is running experimentally at Glens Falls, N. Y. It is a magnetic machine.

Mr. B. G. Clarke, president of the Thomas Iron Company, states that the product of the furnaces in quantity and quality is so much improved that if prices were the same as last year the weekly profit would be \$18,000.

For the triple-expansion engines with forced draft now being fitted to the vessels of the British Navy, a usual piston speed is from 800 to 900 feet per minute. In the Medea, with vertical engines, to be tried this year, 1888, the designed revolutions are 140, with 3 feet 3 inches stroke, or a piston speed of 910 feet per minute. This speed has not been exceeded in any engines, except in those of the torpedo-boat type, which are invariably vertical.

If we may rely upon the account given in *L'Avenir Militaire* of the recent practice of the French Mediterranean squadron under Vice Admiral Amet, in the roads of Toulon, there were fewer breakdowns and mishaps and quicker response to orders than in any similar practice of modern ships, whatever their nationality. The squadron was made up of six ships of the line—Colbert, Devastation, Amiral Duperre, Courbet, Redoubtable and Friedland, the floating batteries Indomptable and Terrible; the Milan, a first-class steel cruiser; the Condor, a cruising torpedo-boat; the Balny and Doudart de Lagree, sea-going torpedo ships, and six torpedo-boats of the harbor defense type. The squadron was manned by 6000 men and carried a battery of 130 big B. L. guns, besides a formidable display of machine guns. Though there was a stiff breeze of wind and a heavy sea running, the squadron formed line, divided into two columns, and formed crescent and wedge without running afoul the one ship of the other, or falling astern from mishap or lack of coal. To those who have studied such displays this will scarcely fail to be looked upon as remarkable.

Hardware.

There is a fair degree of activity in some lines, but more or less complaint is made by manufacturers and jobbers that business is somewhat unsatisfactory. There has been exceedingly little fluctuation in prices, which remain substantially as at our last report, the market being characterized by a fair degree of strength.

Nails.

There has been more irregularity, caused by a struggle between one of the Upper Susquehanna mills and the other Eastern works. Cutting of the extras has been disguised to some extent by lowering of the base price. The volume of business is improving.

Wire Nails.

The market continues without change in prices named last week, and is characterized by firmness, with a fair demand.

At the meeting of the manufacturers which was held in this city last week, it was decided to form two associations, an Eastern and a Western one. The Western Association was immediately organized, consisting of the following members:

HP. NAIL CO., Cleveland, Ohio.
SALEM WIRE NAIL CO., Salem, Ohio.
NEW CASTLE WIRE NAIL CO., New Castle, Pa.
HARTMAN STEEL CO., Beaver Falls, Pa.
PITTSBURGH WIRE NAIL CO., Pittsburgh, Pa.
AMERICAN WIRE NAIL CO., Covington, Ky.
CINCINNATI WIRE NAIL CO., Cincinnati, Ohio.
ST. LOUIS WIRE MILL CO., St. Louis, Mo.
UNITED STATES WIRE NAIL CO., Indianapolis, Ind.

C. B. Beach, of the HP. Nail Co., was chosen president, and R. H. Johnson secretary. The office of the association will be in this city.

Barb Wire.

There is no change in the New York market, manufacturers being busy, and quoting still nominally 4 cents for carload lots of Four-Point Galvanized Barb Wire.

We published in our last issue a telegraphic report of the proceedings of the meeting of the Barb Wire Manufacturers' Association at the Tremont House, Chicago, on the 18th inst. Under the circumstances the report was necessarily very brief, and, as the action taken at the meeting was very important, we now present a more detailed account of what was done. O. M. Gregg, of Crawfordsville, Ind., presided and G. W. Henry, of Joliet, Ill., acted as secretary. The following manufacturers were represented: Ashley Wire Company, Lambert & Bishop Wire Fence Company, Joliet Barb Wire Company, H. B. Scutt & Co., Watkins Barb Fence Company, Joliet Enterprise Company, Shreffler & Van Fleet, Washburn & Moen Mfg. Company, Iowa Barb Wire Company, Gautier Steel Department, Cambria Iron Company, St. Louis Wire Mill Company, I. L. Ellwood & Co., Northwestern Barb Wire Company, Freeman Wire Company, Crandall Mfg. Company, Indiana Wire Fence Company, Fretress Barb Wire Company, Omaha Barb Wire Company. A resolution was unanimously adopted to maintain to July 1 the prices which were agreed upon March 17, subject, of course, to the approval of the manufacturers who took part in the original agreement. Little fear was expressed that this would be carried out, as the experience of members present had shown that prices had been maintained better under this agreement than any previous one. The only point of weakness lies in the direction of the jobbers, a number of whom have large

stocks, purchased before the advance, which they may desire to market at a price under that established by the manufacturers. The jobbers are being urged to co-operate with the manufacturers and to advance their rates to the manufacturers' prices—namely, \$3.25 for Painted and \$4 for Galvanized, f.o.b. Chicago or East St. Louis. It is possible that this may be done, the Chicago jobbers having already expressed their willingness to comply with the request of the manufacturers if the jobbers at other points will unite with them in taking this action. The jobbers say that the success of such a movement will depend largely upon the good faith of the manufacturers, while, on the other hand, the manufacturers say they realize that at present the jobbers hold the key to the situation, and it is in their power to place the business on a substantial basis if they will carry out the policy suggested. In order to restrict production and give the jobbers an opportunity to work off their stock, it was unanimously agreed to recommend that all Barb Wire manufacturers close their mills from July 1 to August 15, inclusive. The Plain Wire manufacturers have been asked to co-operate in this effort to restrict production by selling no Plain Wire for barb fence purposes for shipment between June 25 and August 10. A proposition to make a difference in price of 10 cents per 100 pounds between Two-Point and Four-Point Barb Wire met with favor from some of the manufacturers, but it was not deemed expedient to adopt such a regulation. It was unanimously resolved to hold a meeting at 10 o'clock a. m., at the Southern Hotel, St. Louis, on May 28, to receive reports from the secretary of the action of the different manufacturers relative to the propositions submitted to them for their approval.

The old Plain Fence-Wire Association, which went to pieces as the result chiefly of the Chicago failures in the Barb-Wire trade last year, has been reorganized under the title of the Fence-Wire Association, with G. T. Oliver, of Pittsburgh, chairman, and R. H. Johnson, New York, secretary, the concerns in the association being:

HP. NAIL COMPANY, Cleveland.
AMERICAN WIRE COMPANY, Cleveland.
CLEVELAND ROLLING MILL COMPANY, Cleveland.
HARTMAN STEEL COMPANY, Beaver Falls, Pa.
OLIVER & ROBERTS WIRE COMPANY, Pittsburgh.
CAMBRIA IRON COMPANY, Johnstown, Pa.
STEWART & CO., Easton, Pa.
J. A. ROEBLING'S SONS' COMPANY, Trenton, N. J.
J. WOOL GRISWOLD, Troy, N. Y.
WASHBURN & MOEN MFG. COMPANY, Worcester, Mass.
ST. LOUIS WIRE MILL COMPANY, St. Louis.

The principal reason given for the formation of the association is that for this season, from January to July, the price of Plain Fence Wire has averaged from \$3 to \$5 a ton lower than during the corresponding period of 1887, while the cost of Wire Rods has been about \$3 higher. It is reported that the basis of the agreement is very similar to that upon which the old association rested. The latter embraced an allotment of percentages, and on the basis of sworn monthly returns members were charged \$3 per ton of 2000 pounds on deliveries for the preceding month, and credited \$3 per ton of 2000 pounds on allotted percentage of the total deliveries for that month.

Miscellaneous Prices.

E. C. Atkins & Co., Indianapolis, Ind., have issued their catalogue for the present year, which is an enlargement upon their previous issues and represents some new

goods. They direct special attention to the change in the list price on Circular Saws and some other articles. They state that, to accommodate their customers who may be more speedily and easily reached from that point, they have opened a branch house in Memphis, Tenn., where they will carry a full line of Saws, Saw Tools and Mill Supplies, and have a repair department equipped with improved appliances and tools. The catalogue is a handsome pamphlet of 125 pages. The following prices to the trade have been established for the season 1888-1889 for the Atkins Crosscut Saws, Tools, &c., and it is intimated that these prices will be closely adhered to:

| Crosscut Saws. | | Per Foot. |
|--|--|-----------|
| Silver Steel Diamond, Dexter or Tuttle, including Handles and Raker Gauge. | | \$0.70 |
| Special Steel Dexter, 14 x 16 Gauge, without Handles. | | .50 |
| Special Steel Dexter, 14 x 18 Gauge, without Handles. | | .52 |
| Special Steel Diamond, 14 x 16 Gauge, without Handles. | | .30 |
| Special Steel Diamond, 14 x 18 Gauge, without Handles. | | .32 |
| Lone Star Silver Steel, including Handles. | | .70 |
| Lone Star Special Steel, without Handles. | | .32 |
| Tuttle, Sheffield, Electric, Feather Edge, Common, American, Single Hook, Double Hook and other styles Teeth, 14x16 Gauge. | | .37 |
| Tuttle, Sheffield, Electric, Feather Edge, Common, American, Single Hook, Double Hook and other styles Teeth, 14x18 Gauge. | | .38 |
| Hollow-back Saws, Tuttle or Diamond Tooth, with Handles, either No. 4 or No. 6. | | .18 |
| One-man Saws, either style Handle or Tooth, Silver Steel. | | .50 |
| One-man Saws, either style Handle or Tooth, Special Steel. | | .35 |

| Miscellaneous. | | |
|--|--|-------|
| Handles, No. 1, per pair. | | .28 |
| Handles, Nos. 2, 3 and 4, per pair. | | .18 |
| Single Gauges, per doz. | | .75 |
| Double Gauges, per doz. | | 1.00 |
| Criterion Saw Sets, Nos. 1 and 2, per doz. | | 7.50 |
| Atkins's Adjustable Saw Sets, per doz. | | 6.00 |
| Atkins's Lever Sets, No. 1, for Hand and Wood Saws, per doz. | | 6.00 |
| Excelsior Tools, for Hand and Wood Saws, per doz. | | 6.00 |
| Perfection Tools, for Hand and Wood saws, per doz. | | 15.00 |

The Metal Binding Manufacturer's Association have adopted the following price list and terms for the season of 1888, the list bearing date March 20:

Round-Hem and Flat Zinc Binding.

| | |
|----------------------|--------|
| 4-4, per dozen sets. | \$3.36 |
| 5-4, per dozen sets. | 4.20 |
| 6-4, per dozen sets. | 5.04 |
| 8-4, per dozen sets. | 6.72 |

Round-Hem and Flat Brass Binding.

| | |
|----------------------|--------|
| 4-4, per dozen sets. | \$4.80 |
| 5-4, per dozen sets. | 6.00 |
| 6-4, per dozen sets. | 7.20 |
| 8-4, per dozen sets. | 9.60 |

The discounts adopted are as follows:

| | |
|--|-----------|
| On Round-Hem Binding. | 50 % |
| On Flat Binding. | 50 & 10 % |
| with an additional discount of 10 per cent. on 2 gross at one shipment. Terms net 30 days from September 1, 1888, or 2 per cent. discount for cash in ten days. Also 1 per cent. a month for cash will be allowed for prepayment. The following manufacturers united in this action: | |
| UNITED STATES METALLIC BINDING COMPANY, Painesville, Ohio. | |
| PAINESVILLE, METALLIC BINDING COMPANY, Painesville, Ohio. | |
| J. T. GILMORE & CO., Painesville, Ohio. | |
| RAY HUBBELL MFG. COMPANY, Northville, New York. | |
| J. A. COLE, Northville, New York. | |

The following are the prices of Hames manufactured by B. Seitz, Shrewsbury, Pa., delivered on cars at Shrewsbury, the prices given being subject to a discount of 5 per cent. for cash:

| | Per doz. |
|--|----------|
| Seitz Shoulder Tie Hames, heavy books. | \$3.65 |
| Seitz Shoulder Tie Hames, medium books. | 3.40 |
| Seitz Patent Hames, heavy books. | 6.00 |
| Seitz Patent Hames, medium books. | 5.75 |
| Seitz London Tie Hames. | 6.50 |
| Seitz London Patent Hames. | 8.75 |
| Common Sawed Hames. | 2.25 |
| Common Sawed Patent Hames. | 4.50 |
| With Line Rings, 35 cents per dozen extra. | |

The following are the prices of Star Hames, which are net:

| | |
|-------------------------------|--------|
| Star Hames, per dozen. | \$7.00 |
| Star Patent Hames, per dozen. | 9.00 |

A meeting of the manufacturers of Cast Butts was held last week, but no change was made in quotations.

The prices of Rope continue firm, Manila and Sisal being held steadily at previous prices.

Tubular Lanterns are held pretty regularly by the different manufacturers at the present comparatively low prices. The competition is, however, animated and active efforts are being made to secure orders.

The meeting of the Common Carriage Bolt Association was held in this city last week, and after a careful consideration of the situation it was decided to make no change in prices.

The efforts which have been making to effect an organization of the manufacturers of Machine Bolts are still continued, and it is intimated that while the object sought to be accomplished is a difficult one, there is an increased probability of its being carried into effect.

The manufacturers of Nuts also met last week, but no action of importance is announced.

Trade Topics.

With reference to the method adopted by John Warr, Eureka, Kan., of stimulating trade by the giving of premiums, to which reference was made in a former issue, we have from Mr. Warr the following advices, in which he alludes to the success of the method as adopted by him several years ago:

I have before tried the plan of distributing premiums among customers, and found it a successful way of advertising, for, of course, that is all it is done for. Four years ago I made a very similar distribution, which was so successful that I again determined to do as set forth in circular No. 2, referred to by you. I am even now observing the effect of this advertising, realizing quite a marked increase in trade, and a good percentage of my customers make anxious inquiries concerning the matter, thus showing that it is constantly before them.

As bearing on the question as to the desirability of a withdrawal of all warranties on Saws, we take pleasure in laying before our readers the following letter from a Hardwareman in Indiana, whose experience in the matter is interesting as confirming the advices that have been received from other sources in regard to the very large percentage of good Saws returned, while at the same time it indicates the advantage there might be to the dealer in having the Saws sold without warranty. Our correspondent writes:

I returned to E. C. Atkins & Co., eight Crosscut Saws out of 185 sold. Upon examination all were found as perfect in temper and quality of Steel as could be made. Upon the receipt of the above information from the manufacturers I took the warrant off all Saws and made the price lower. Since then I have sold more Saws, have had no disputes, have made no enemies, and have not heard of a bad Saw. The manufacturers will confer a great favor if they will forget when they are getting up labels that there is such a word as warrant.

The following letter from a Hardwareman in Michigan refers to the warranty on Saws and the manner in which it is abused, referring also to other lines to which similar remarks apply. Its publication will, we trust, be not only of interest to our readers, but of service in helping to correct the abuses in question, calling attention, as it does, to what the Hardwareman can do in educating his customers and protecting the manufacturer. Our correspondent writes:

I have been in the retail Hardware trade 25 years, and during that time have sold hundreds of Cross-Cut Saws. My experience is that the reason for Saws being returned is not to be found in their poor quality or defective

ness as much as in the fault of the man filing or fitting them. My practice for many years has been to warrant the Saws, and then in case of any of them being returned, clean them nicely with emery cloth, joint, file and set them, and place them again on sale. I have often done this, and found the second man thoroughly satisfied, pronouncing the Saw excellent.

Pocket Cutlery is most shamefully treated with rough usage and from a want of knowing how to put an edge on the knife so that it will cut nicely and not break or turn. When we have goods of good quality and they are returned, and there is no fault in the goods, we try to teach customers where the fault is. By this means, if he is a sensible person, he will see that we have sold him good goods, and he is well satisfied.

A prominent Hardware house in the South, referring to the system adopted by many manufacturers of giving quantity discounts, point out the disadvantage under which they labor under this system, and suggest that the interests of the trade would be better served if prices were made to large houses without regard to quantity of goods purchased. The question is an important and difficult one, and we take pleasure in laying our correspondents' views before the trade:

We labor under some disadvantages from the system adopted by large manufacturers of basing discounts on the quantity of goods purchased, requiring purchasers to buy certain quantities in order to secure best discounts. We think that large dealers, regardless of locality, should be given an equal chance, and the quantity necessary to secure the best terms, and discounts be lowered when purchasers are of good standing and make prompt payments. A discussion on this point might be productive of good results.

The letter we print below is from a Pennsylvania Hardwareman. It will be seen that he refers to a shortage in packages of Screws of a certain make, alluding at the same time to the shortage in Tacks, which has received considerable attention at the hands of the trade. Whatever may be said in excuse of a practice which prevails too generally of putting up Tacks in short weights, there is certainly no reason why Screws should not be given full count in view of the high prices at which they are now held by the manufacturers—50 per cent. more than the goods were sold at a comparatively short time ago. We do not, however, apprehend that the difficulty experienced by our correspondent is at all general, and presume that Screws are almost uniformly put up honestly. Our correspondent writes:

We had a little experience lately that may benefit some of your readers. We lost one of our best customers a short time ago because we could not meet a quotation on Screws. The order was a large one, and we had figured on a very close margin, but after trying in vain at several factories we were compelled to let the order go away from home or sell for glory, which we did not care to do, as we could not meet a quotation which they had from abroad. Being again asked to bid, the result was the same, and in trying to find the cause of our defeat one of their workmen took a 10-gross package and counted every gross, and found they all ran from 8 to 15 Screws short, which made a difference of almost 10 per cent. That was where we got left. This shortage in Tacks is an old story, but we never heard it spoken of in Screws, and having two or three other makes of Screws in stock we tried some of them, but did not find any shortage.

Items.

The William Frankfurth Hardware Company, Milwaukee, Wis., are issuing an exceedingly complete catalogue representing the large lines of goods in which they deal. It is a large volume of nearly 1000 pages, which has evidently been compiled with care and skill, the effort being made to represent concisely the large variety of

goods to which it relates. It is divided into the following departments, to which space is devoted as indicated:

| | Page. |
|---|---------|
| Tools..... | 1-159 |
| Builders' Hardware..... | 160-399 |
| Miscellaneous Hardware..... | 400-620 |
| Farming Implements, Shovels, Spades, &c..... | 621-669 |
| Fishing Tackle, Revolvers and Sporting Goods..... | 670-700 |
| Pocket and Table Cutlery, Shears, Spoons, &c..... | 701-765 |
| House-Furnishing Goods..... | 766-825 |
| Tinners' Wares and Trimmings..... | 826-935 |
| Bird Cages..... | 936-954 |
| Wire, Metals and Tinners' Tools..... | 955-976 |

It will thus be seen that a convenient arrangement has been adopted which will facilitate reference to the different lines of goods covered by the volume. In their introductory note to the trade they refer to the foundation of their firm, dating back more than 26 years. This recalls to those who were familiar with the trade at that time the fact that William Frankfurth engaged in business in 1861 as a retail Hardware merchant. In 1867 L. Maschauer was admitted as partner, the firm then becoming William Frankfurth & Co., whose business continued steadily to increase until it became necessary to look for larger quarters, and in 1885 the present company were organized, occupying the elegant and roomy quarters on Clybourn street, near the new St. Paul passenger depot, where they carry on an exclusively wholesale business. The officers of the company are as follows: William Frankfurth, president; William Jahns, vice-president; Edwin Foerster, secretary, and Lorenz Maschauer, manager. The company's enterprise, as well as the increasing importance of their business, are illustrated in the issuing of this catalogue, which will take its place among the most complete at the service of the trade. The volume, we may add, is printed by J. H. Yewdale & Sons Company, who make a specialty of printing and illustrating catalogues, and bound by Herman Voss, who deserve credit for the manner in which the work is done.

The Lamson & Goodnow Mfg. Company, Shelburne Falls, Mass., and 33 Chambers street, New York, have issued an illustrated catalogue of their Cutlery, of which the leading patterns are represented in finely executed engravings. It is an excellently printed pamphlet of 66 pages, and will be found convenient. A view of the factories of the company at Shelburne Falls, Mass., is given.

The price list of E. R. Saxton, Buffalo, N. Y., for whom Fred. B. Gurney, 116 Chambers street, New York, is agent, illustrates the line of Bit Braces, Wrenches, Door Hangers, Butter Spades and other Hardware specialties manufactured by him. Among these goods Braces have a prominent place, and a variety of styles are illustrated.

E. M. Richardson, Waltham, Mass., in a recently issued circular relating to his Shedd's Blind Fasteners, contradicts the report that he has discontinued the manufacture of the goods, and calls attention to the different patterns he is making.

The Enterprise Mfg. Company, Philadelphia, Pa., issue a circular relating to their suit against the American Machine Company for alleged infringements on their Enterprise Meat Cutter patents, and state that a temporary injunction has been granted them.

Congdon & Henry, Rapid City, Dak., have disposed of their stock, fixtures, store, warehouses and good will to the Congdon & Henry Hardware Company, who will continue business at their former location on St. Joe street. The new company thus organized announcing the change, refer to their increased capital and large stock as-

enabling them to serve their customers more efficiently than ever. The *Journal*, Rapid City, has an account of the history of the firm, which is referred to as one of the old established institutions of the city, and a description is given of their new store, the extent, elegance and convenience of which are alluded to.

It will be seen that the Edward Storm Spring Company, Poughkeepsie, N. Y., for whom John H. Graham & Co., 113 Chambers street, New York, are agents, illustrate their Humphrey Pony Hand Elevator in their advertisement on page , giving also some information in regard to its construction, capacity and price.

I. A. Weston & Co., Syracuse, N. Y., issue a neat price list for the current year, showing their Bicycles, Tricycles and Velocipedes. They also give a detailed description of the construction of the wheel which they manufacture, which is illustrated, showing its special features, mention being made of the advantages possessed by it. These wheels can be made of any size to fit any vehicle, and are supplied in diameters ranging from 12 to 42 inches.

The illustrated catalogue of the Howe Pump and Engine Company, Indianapolis, Ind., represents their Iron Tower Wind Mills, Force Pumps, Submerged Cylinder and Suction Force Pumps, of which full descriptions are given. The pamphlet closes with a price list of Mills, Tanks, pumps, &c., with a reference to the extra Parts and special tools manufactured by the company.

The Bucket Pump and Water Purifier Company, 441 and 443 Plum street, Cincinnati, Ohio, issue a pamphlet describing their Pump, and illustrating its construction and its method of operation. The effect of the Pump in purifying the water of a well is emphasized.

J. H. Hoague, Chicopee, Mass., has issued a revised edition of his price list, which includes the goods that have recently been added to his line. The Chicopee Automatic Drills, Chucks, the Bit Brace Tool Set, Bench Stops, Draw Knife Chamferer Gauge and other tools are illustrated.

Valentine Clad, 117 and 119 South Eleventh street, Philadelphia, in his 1888 catalogue and price list illustrates his line of Ice-Cream Freezers, Crushers, Cans, Tubs, Molds, &c. The Freezers represented are large machines, and made expressly for ice-cream manufacturers for heavy wear and tear, the Freezers being operated by hand or power. The catalogue represents a large variety of Molds and specialties connected with this line, and will be useful for reference for dealers who do not carry the goods in stock.

The Grand Rapids Refrigerator Company, Grand Rapids, Mich., issue a variety of advertising matter relating to their line of Leonard Dry Air Refrigerators. Among these are illustrated circulars which represent some of the Refrigerators in use, in connection with attractive pictures which emphasize points in regard to them, information concerning the Refrigerators and a brief description of some of the leading patterns being also given. Their catalogue in reduced form also shows this line of goods. Other matter, pictorial and descriptive, which is intended to be hung up in the store, is also sent out.

The catalogue of the American Bit Brace Company, Buffalo, N. Y., for whom Sise, Gibson & Co., 100 Chambers street, New York, are New York City agents, and Walsh, Hoen & Von Kapff, Baltimore, Md., Southern agents, represents an attractive and interesting line of goods, including several new patterns. A detailed de-

scription is given of the Pedersen Patent Norwegian Bit Brace and the Pedersen Bit Brace, and also of the Pederson Patent Ratchet mechanism, which is referred to as exceptionally strong, durable, simple and neat in appearance. The line of Braces in which these features are introduced is illustrated, together with Ratchet Screwdrivers, Hollow Handled Screw Driver Sets and Hollow Handled Tool Sets, in which some new goods are represented.

The United States Metallic Binding Company, Painesville, Ohio, issue circulars relating to their new Figured U. S. Metallic Binding for Oilcloth, a sample of which is also sent out. In this new pattern there is a raised figure on the surface of the binding, which is described as always keeping bright and showing plainly at a distance. Their U. S. Binding is made in Brass or Zinc strips coiled and put up in neat packages of one set each packed for shipment in cases of 144 and 72 sets, concerning which particulars are given, but it is intimated that any other assortment can be put up if desired.

The secretary of the Cincinnati Corrugating Company, Cincinnati, Ohio, has been sending out a timely circular, from which, containing as it does practical suggestions and information in regard to their roofing, we make the following extract:

First inviting your attention to the fact that the regular lengths of Corrugated Iron which we are carrying in stock are 5, 6, 7, 8, 9 and 10 feet, we note that almost invariably architects and mechanical engineers, in specifying lengths of corrugated sheets or spacing supports therefor on iron-framed roofs, name lengths which are different from those carried in stock, obviously necessitating delay and often greater cost, as in such cases the required lengths must either be rolled specially or cut from stock lengths as are carried by all the larger makers of Corrugated Iron. We judge that in planning disposition of purlins or other supports for the corrugated sheets the rule seems to be to place them equally distant between centers. But why would it not be as well, from any standpoint, or, better, for reason previously indicated, to plan to use regular lengths, not necessarily using one length only on each roof, but any regular lengths, or such as can be cut therefrom with least waste?

The company state that the use of Corrugated Iron is very largely increasing, and that considerable stocks of regular lengths and of different gauges are kept, and that they have at present over 1500 tons in stock. They also call attention to the fact that their Corrugated Iron is made under a press and not by rolling; that it is coated with the best metallic paint, and the sheets provided with their patent edge corrugations.

McLagon Foundry Company, New Haven, Conn., issue a circular in which they describe their Improved Cellar Window Frame and Sash, and in which they point out the advantages possessed by it over other Frames of wood or iron that have heretofore been produced. They have Frames now ready for a number of sizes of windows.

It is announced that the firm of Taylor, Cooke & Co., Little Falls, N. Y., has been dissolved, and that a new firm, composed of John R. Taylor, Edwin M. Cooke and H. C. Markham, has been formed and will do business in the same place as the former firm, under the name and style of Taylor, Cooke & Co.

The Hamblin & Russell Mfg. Company, Worcester, Mass., have issued a circular describing their manufactures, and calling special attention to the new goods which they have added this season. Among these are a line of Standard Wire Coat and Hat, Wardrobe and Paper File Hooks, Towel Roller, Splasher Holders, &c.

The Outlook for Trade.

In order to obtain full and reliable reports in regard to the condition of business and the prevailing tone in different parts of the country we have addressed inquiries to a number of houses, large and small, and give below extracts from some of the letters received. It will be observed that in most cases our correspondents write hopefully of the season's business, some of them referring to local influences which will probably have a tendency to diminish it somewhat in volume, while others allude to the very favorable circumstances which induce the expectation of an especially satisfactory trade.

IOWA.

Keokuk.—General business about the same as last year, with perhaps a better feeling as to the future. Collections very good, with occasional exceptions with weak parties, who depend on prompt pay from their customers to pay their bills. Stocks of Hardware exceedingly small, both retailers and jobbers buying very sparingly. Future prospects depend altogether on coming crop. If it is large it should make business exceedingly good, as we have had failures or partial failures in this section since 1881, while Missouri River country has uniformly had good crops except the last.

Fort Madison.—We are looking forward for a good trade this season. Farmers are getting to work, and find ground in good condition. Crops average about as usual. Fort Madison is having a railroad and real estate boom, and hundreds of people are pouring in from all quarters, not a single dwelling or business house being vacant. Not less than 500 dwellings and cottages will be built this summer, of which about 100 are under way. We have four Hardware houses now, and two more are coming in. Stocks are heavy and comparatively fresh, and collections very satisfactory. Trade for the past three months was good.

Vinton.—Since the 1st of January our trade has been better than same time a year ago, there being more cash trade and less credit. Collections have been very good. Although trade is large, we think stocks had better be cut down, buying oftener and carrying less stock. The building outlook is better this year, the prospect being nearly twice as good as last year. On account of low prices on stock, grain, &c., farmers are very cautious about contracting debts. The outlook for the future is not very encouraging, but after the crops are far enough along to guarantee sufficient returns to the farmer business may brighten.

Ottumwa.—General business in southern Iowa has been seriously interfered with since January 1 by various causes:

1. Very severe weather and snow blockades.
2. Demoralization of freight rates and railroad stocks.
3. Poor crops in many portions of the State for three years past have drained farmers of their surplus means and stopped improvements both in towns and country, at the same time making collections very slow. The very low rates of freight that have been made from Chicago to the Missouri River and all intermediate points during the past month or six weeks have induced many dealers to anticipate their wants and buy freely, but the demand for goods by the consumers is, and we think will be, very moderate. Now that old rates have been restored we do not think that manufacturers or jobbers will be crowded with orders for some time to come. General business in Iowa will be largely influenced by the crop prospects this year.

Earlville.—The spring season is rather backward and planting may be rather late,

much depending on the weather during April. General business has been a fair average the last decade. Nails and Builders' Hardware were in good demand the latter part of the summer season. The fall trade was largely favored with a good heating stove trade. Hard coal being exceedingly high in Iowa, many wood heaters were substituted for hard-coal burners, wood being plentiful and comparatively cheap in Eastern Iowa. Collections on the whole were good, although some districts were seriously affected by the drought, which caused a partial failure of crops, but farmers avoided running in debt as much as possible. This, however, being the corn and hog belt, and also a good dairy district, good prices were obtained for farm products, thus leaving our farmers in good shape for the coming season. Of course this prosperous condition will not apply to all sections of Iowa. Stocks of Hardware are not heavy, so far as the writer has been able to observe in this section. Goods are bought lightly, and a general assortment is kept up by buying often. Trade is well canvassed by all the leading Western jobbing houses. I may add that dealers bought largely in the staple line of heavy goods during the cut freight rates which prevailed on all trunk lines during March. The prospect for building is good, and general improvements may be looked for extensively the coming season. There is still room for a vast amount of improvement in this direction. During the severe cold weather there is much waste of crops in Iowa, owing to the absence of suitable buildings to protect them, and better shelter for the stock is necessary, otherwise farming will not be profitable. The greatest drawback to a building boom is the high price of lumber, and its scarcity will affect building in the early part of the season. However, we anticipate a large amount of good solid improvements during the latter part of the season. The low prices of Nails and Builders' Hardware are largely in favor of consumers. The general feeling in regard to the outlook is very encouraging. Farmers are obtaining fair prices for their product, and will trade correspondingly during the season. Iowa is suffering some drawback on account of the emigration of its young men to the Western Territories without a corresponding influx of others to take their places. Foreign emigration has completely ceased for some cause, thus placing our State in a retrograde position, although there is an abundance of vacant land in this State, and the fertility of our soil cannot be questioned, a healthful climate being also in our favor. Agriculturalists can find good homes in Iowa.

Fort Dodge.—Business in this section is good—better than usual—and, while collections are a trifle slow, there is some money coming in all the time, and, altogether, we think collections are somewhat better than a year ago. Stocks of hardware in our territory are unusually large owing to the cut in freights during February and March, but, as a rule, assortments are not very good. The prospect for building is not very promising. However, some building will be done, mainly of light character. Heavy Hardware will be more in demand this spring than Shelf Goods. Prospects in general are good for spring trade.

COLORADO.

Denver.—The condition of trade and the outlook for the coming season are good. Stocks of Hardware are large and collections easy. There are good prospects for building and trade in general is good, the feeling in regard to business being satisfactory. Competition is very active. Speculation in real estate will have a bad future tendency, how soon we do not know. Prices here are out close. The

material interests of this State are in splendid condition. Lack of snow in the mountains may result in a summer drought, but we will not be sure of this for another month.

Pueblo.—The state of general business is very good and collections fair, with good average stocks of Hardware. Prospects for building, &c., are better than ever before, and the general feeling in regard to the outlook is good.

MARYLAND.

Baltimore.—In regard to stocks of Hardware the carrying is small. Collections are fair and the prospects for building very good. The business outlook is very encouraging and trade moderately good.

UTAH.

Salt Lake City.—Business generally throughout this Territory is only moderately good. Collections are slow. Stocks of Hardware in this city and principal towns in the Territory are ample for present purposes. A good deal of money has been invested in Salt Lake City during the past year by Eastern parties, and price of real estate is advancing rapidly. Many who have invested are coming here to settle. There will be considerable building done this season—more than for a good many years. We have the best "all the year round" climate in the United States, which, with the great and varied resources of the Territory, is becoming appreciated by both Eastern and Western people. The U. C. R. R. will soon commence extending their line to Southern California, which will develop the mining interests in a large section of country tributary to this city which has hitherto lain dormant for want of railroad transportation. We will undoubtedly have one or two more railroads from the East in less than two years, and the present outlook for the rapid development of the resources of the Territory I consider extremely good.

FLORIDA.

Tampa.—Our city and surroundings cannot very well be used as you desire in your letter owing to the visit of the yellow fever last fall. Through its visitation trade is prostrated and will remain so until another season rolls around to see if we are to have another call from this same malady. Collections cannot be made. But little building, and that of no account, is in progress. Stocks of Hardware are over full, with no demand. Even with this discouraging report we feel confident of a grand boom for Tampa next fall. We do not anticipate another visit from the fever, but the weak-kneed are afraid. At present the citizens are building water-works. They have made a donation of \$11,000 to induce another cigar factory to settle here and are arranging for a large hotel and a permanent exhibition building for South Florida. We are also bridging the river. So you see we are not dead in our shell, with all our troubles. Even the fever was not so very bad—100 deaths in three months out of a population of over 7000.

MICHIGAN.

Detroit.—From our standpoint as a city retail Hardware store, the condition of trade is very good. Our business so far this year has been better than for two years previous, and we know of no reason why the improvement should not continue. We believe stocks are comparatively small, there being no speculation in Hardware nowadays, and the feeling is more conservative. Building prospects are good and no labor troubles in sight. Collections are rather slow.

Greenville.—Spring has hardly commenced here yet; still the outlook is fair. Our crops were good last year and lumber

brings a good price. We secured another railroad last fall, and our town is experiencing something of a boom. We think the usual amount of building will be done here and believe stocks are full. The drummers see to it that stocks do not get low. Prospects are favorable for full average trade.

Adrian.—Stocks in dealers' hands throughout this section are not exceedingly heavy, and, while collections are somewhat slow, the volume of business up to this time compares favorably with last year. The building outlook is bad, and we presume that later on, as the political excitement begins to ferment, general trade will feel the effects of it.

Allegan.—The trade of our section has been very poor for the last four months, and has improved but little up to the present time. This is owing to the failure in crops of last season. The stocks of Hardware are fair. Collections are slow and not to be depended on. The prospect for building is not good, and very few houses will be erected this season. The trade in general is not so good as in years past, and the general feeling is that we will not have a good trade until the new crops are harvested. This is not a very cheering prospect, but the best we have to offer at present.

Stanton.—We are meeting with a good healthy demand for goods. While trade has opened much later than past seasons, we find upon the arrival of mild spring weather that the volume of business is quite satisfactory. We observe more caution in contracting obligations and a growing tendency to pay more promptly. On the whole, we think collections better than last year. In fact, more customers pay cash at time of purchase, and in other cases do not want so much time. Prospects for buildings of moderate cost fair. Stocks of Hardware good, especially in staple goods. In general, we consider business good in our growing county.

Fenton.—Springtime has arrived, and is the time of year when we should reasonably look for a revival of business. Yet I fear our anticipations for a better trade will not be realized. The past 12 weeks have been a period of unusual quiet, and the volume of business short of its usual proportion. No time in my recollection for years past has equaled this for general trade. The demand for Hardware has been unusually light. However, since April 1 there has been more activity and a somewhat brighter appearance, yet nothing of particular note has taken place. Some light goods, such as Shovels, Hoes, Forks, Tinware, &c., have been moving, but Hardware of any great amount cannot be forced for cash at the very lowest prices. Farmers here buy cautiously and sparingly. The outlook for wheat is regarded as poor, the wheat having come through the winter sickly-looking. Clover is much in the same condition. From what can be seen and by inquiry from the best sources there is not much encouragement for any great business this year. Our farmers are down on free trade on wool, which has a depressed effect on prices for that staple. There is much inquiry for money by business men and farmers to bridge over their present wants until June. But few new buildings are to go up this season, but there will be some stir in slicking up and repairing. Collections were very fair in January and February. They are very slow now, and from this forward for 60 days may be regarded as few and far between.

East Saginaw.—As regards the state of general business we consider it fairly good in our section, and collections are about as usual. Our traveling men report from the different sections they visit that the stocks

of Hardware are small, and the prospects for building seem to be very good. The general feeling of the trade we see is that they will have a good business during the coming summer and fall, and we trust they may not be disappointed. We certainly think the outlook is very good, although the orders we have received up to the present time have not been as great as those of last year for the same period; but there are a great many reasons why the smaller dealers should have anticipated their wants more largely last year, as Iron and Nails were very stiff, and whenever that is the case the smaller trade are liable to order more liberally. But we think the volume of trade the coming season will be fully up to that of the spring of 1887.

NEW MEXICO.

Silver City.—Our prospects for the coming season are much better than they have been for the past three years. Our gold and silver mines are producing above the average. We are also sending large quantities of iron ore to the different smelters for flux used in the treatment of other ores. Mills are going up around us for the treatment of the lower grades of gold and silver ores, while the cattle interests are looking much brighter. Our stocks of merchandise are unusually large. Collections are fair, and the prospects for building good. So we can see a general improvement all around.

ILLINOIS.

Rock Island.—Stocks of goods are about as usual at this season of the year. Collections slow. Prospects for building are better, though no great improvement can be expected until we get a good crop, for we have had but partial crops for two seasons in succession.

Jerseyville.—Collections are and have been very good during the past winter. The prospect for building is only moderately fair. Our trade is not booming by any means, but it is in a steady and healthy condition. We are totally dependent on agricultural pursuits here, and the coming crops will virtually, or in a great measure, determine trade for 1888. Hardware stocks in this section are generally tolerably well filled.

MISSISSIPPI.

Vicksburg.—Taking our own business as a criterion, we are warranted in saying that business in general is better than usual in this section at this season of the year. We deal largely in Hardware, Guns, Gun Material and Agricultural Implements, and our trade in the latter has been heavier this season than ever before. We have found collections far more satisfactory than in former years, and our customers more inclined to take advantage of cash discounts. Considerable building is in progress in all sections, and the general financial condition is considered healthier than for some time. We carry a complete stock of Hardware, but studiously avoid the evils of overstocking, and believe our competitors adopt the same course. We cannot say that there are very heavy stocks of Hardware in this section, but sufficiently large, however, to meet the wants of our trade. On the whole, we think the future of our section is bright and promising, and the general feeling encouraging and cheerful. Our country is being gradually developed, our population is increasing, and the volume of business growing proportionately.

PENNSYLVANIA.

Reading.—Stocks of Hardware in this section are good, verging on large. Collections are fair to good. Prospects for building are good, although we do not consider the outlook as good as last year. At the same time the settlement of the

affairs of the Reading Railroad upon a satisfactory basis inspires hope for a large business in this section this year.

MONTANA.

Helena.—Our sales are good and each succeeding year shows a satisfactory improvement in amount of business. The general outlook we regard as favorable. We are careful in extending credits and find collections fairly good. Our distance from market necessitates the carrying of large stocks. Building prospects are particularly good. Many fine business blocks will be erected this year, also a large number of dwellings. Our mining interests, upon which we are largely dependent, are prosperous and attracting much outside attention and investment, and we have reason to believe that works will be erected here this season for smelting and handling our ores.

INDIANA.

Evansville.—Our wholesale, and especially manufacturing, business this year is better than the same time last year, with fair prospects for the near future. Retail business *vice versa*, mainly from the effects of last year's drought. Collections slow. Stocks of Hardware larger than former years, but less in value. Prospects of building good. From present outlook expect a good crop of wheat and fruit.

Paoli.—Prospect at present is very poor for trade. Farmers in southern Indiana are, as a general rule, hard run. Their crops last year were almost an entire failure on account of the dry summer. If crops are even fair this season we expect a good fall trade.

La Fayette.—The outlook for trade is not good. Failure of last year's corn crop and present wheat crop confirm it. Stocks of Hardware are light, collections poor, prospects for building fair. The crop failures and the excitement of a Presidential campaign will tend to make the year a hard one.

Lebanon.—The prospect for wheat in this section, so far as I can determine, is very poor. We cannot make over one-half crop. The clover crop is all killed. Trade would be good were it not for the wheat and clover failures. We look for a fair building trade. Business has opened up well and we hope it will continue fair through the season. Stocks of Hardware on hand are generally large. Collections are very poor, which is always the case in April, on account of tax paying. Collections will be dull until the corn crop is gathered and marketed. Reports from Southern Indiana are that the wheat crop is better there than in any other part of the State.

The Edgar Thomson Steel Works in Operation.

After an idleness of nearly five months the Edgar Thomson Steel Works, of Carnegie Bros. & Co., Limited, at Braddock, Pa., have partly resumed operations, and on the terms embraced in the proposition of Andrew Carnegie, which were published in full in our issue of the 5th inst. These call for two turns of 12 hours each, instead of three turns of eight hours, as formerly. On Friday, the 20th inst., it became known that the firm had decided to ignore the Knights of Labor and endeavor to start the works with non-union men. On the afternoon of that day over 200 men came voluntarily to the office of General Superintendent Jones and offered to resume work. Their offer was at once accepted and they were started to work in the different departments preparatory to starting the works in operation on Monday

morning, the 23d inst. The following general notice, signed by the general superintendent, was also posted, up in numerous places about the works:

The Edgar Thomson Works will resume operations on Monday, April 23, 1888, at 7 o'clock a. m. All persons wishing employment can call at general office of steel department and at the office of Mr. James Gailey, at the blast furnaces, where the scale can be signed and the men assigned to positions.

It is expected that by the last of this week enough men will have applied for work to put the works in operation on one turn and also to start up two of the blast furnaces, and that in a short time the works will be running full in all departments. It is not expected that there will be any trouble over the employment of non-union men, but in order to be prepared for any emergency the company have brought 100 Pinkerton detectives to Braddock, and, should any disturbance occur, they will be at once called upon to quell it. The following notices, signed by the sheriff of Allegheny County, have also been posted in many prominent places in the vicinity of the works:

All persons are hereby notified to forthwith desist from assembling at or near the Edgar Thomson Steel Works, near Braddock, Pa., and from all disorderly conduct, and from any interference with the works and the management thereof, and all assemblies in the neighborhood thereof are hereby forbidden.

Superintendent Jones has announced that no discrimination will be made between union men and non-union men if they desire to return to work, and ample protection will be accorded to every man. It is the common belief that the great strike is over and that the Knights of Labor have suffered a defeat.

Our Pittsburgh correspondent telegraphs the following review of the situation at the time of going to press: "Operations are being gradually resumed at the Edgar Thomson Steel Works of Carnegie Bros. & Co., Limited, at Braddock, Pa. But little trouble has been experienced by the management thus far in securing competent workmen as fast as needed. At the present time over 700 men are at work and requests for positions in the works are coming in from every quarter. Furnaces A and B have already resumed operations. As soon as enough pig iron is made the converting department and the rail mill will be started up. No trouble of any kind has occurred between the Knights of Labor and the men who have gone to work. The strike is virtually broken, and the Knights of Labor have been defeated."

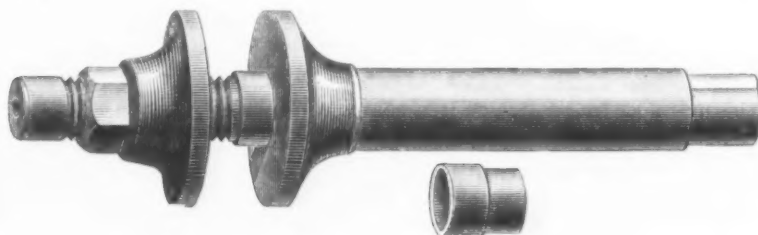
Our Pittsburgh correspondent telegraphs: "A regular monthly meeting of the Bessemer Merchant Steel Association was held in the Monongahela House, Pittsburgh to-day. W. L. King, of Jones & Loughlins, Limited, chairman of the association, was in the chair, and R. H. Johnson, of New York City, acted as secretary. There was a very full attendance, the following firms being represented in person: Jones & Loughlins, Limited; Linden Steel Company, Limited; Spang Steel and Iron Company, Limited; Park Bros. & Co., Limited, all of Pittsburgh; Hartman Steel Company, Limited, Beaver Falls, Pa.; Gautier Steel Department of Cambria Iron Company, Johnstown, Pa.; Sweets Mfg. Company, Syracuse, N. Y.; Troy Steel and Iron Company, Troy, N. Y. After a full interchange of views, it was decided to make no change in base price or extras. It was also stated by the members present that the extras are being fully maintained. No other action was taken. The association adjourned to meet in New York City on Wednesday, June 6th next.

No. 2 Springfield Roadster, 1888 Pattern.

The trade are familiar with the Springfield Roadster, of which we have already given a description in *The Iron Age*, and which is manufactured by the Springfield Bicycle Mfg. Company, No. 9 Cornhill, Boston, Mass. The company have, however, put on the market the present season their No. 2, 1888 pattern, in which the wheel has ball bearings all around of (the Bown patent) lateral adjustment, with two rows of balls on each side of the front wheel axle, two rows on each clutch stud, and one row on each side of rear wheel axle, with overlapping fork fastening to the bearing case to make it rigid and firm. The accompanying illustrations represent the construction, Fig. 1 giving a sectional view of the ball bearing and its adjustment to the roadster, and Fig. 2 showing the ball bearing assembled with the bearing case and the position of latch from which it is adjusted. The price of the machine thus furnished with ball bearings is \$100, and as the construction of the

stroys everything. This fury of the chemical world is the element fluorine. It exists peacefully in company with calcium in fluor-spar and also in a few other com-

slip within it, leaving the projecting part to receive a wheel having a $\frac{5}{16}$ -inch hole. Removing the shell entirely from the arbor will make it suitable for $\frac{1}{4}$ -inch



Improved Adjustable Arbor.

pounds, but, when isolated, as it recently has been by M. Henri Moissan, is a rabid gas that nothing can resist. It combines with all the metals, explosively with some, or, if they are already combined with some other non-metallic element, it tears them from it and takes them to itself. In uniting with sodium, potassium, calcium, magnesium and aluminium, the metals become heated even to redness by the

openings. This tool is made of steel, and the nuts are hardened and finished, and it is put on the market as a first-class tool in every respect. They are made in four sizes, as follows: No. 1, capacity, $\frac{1}{8}$, $\frac{5}{16}$ and $\frac{3}{4}$ inch; No. 2, capacity, $\frac{3}{8}$, $\frac{7}{8}$ and $\frac{1}{2}$ inch; No. 3, capacity, $\frac{1}{2}$, $\frac{3}{4}$ and $\frac{5}{8}$ inch; No. 4, capacity, $\frac{3}{4}$, $1\frac{1}{8}$ and $\frac{3}{4}$ inch.

Pole-Driving Attachment.

Rudolph Peters, 225 Erie street, Cleveland, Ohio, is putting on the market the pole-driving attachment illustrated below. This article is attached to the right foot, and is used, as its name implies, in driving poles. The directions for its use state that by applying the full weight of the body to the pole in the manner indicated in the cut a few vigorous jerks will in light ground drive any size of pole sufficiently deep to insure a safe stand. In hard ground with thick poles it is stated that it may be found necessary to use a crowbar, which should be smaller than the pole, when the attachment being used the pole can be driven so that it will stand, it is claimed, better than if fixed in other ways. This attachment is made regularly of malleable iron, but also when desired either of phos-

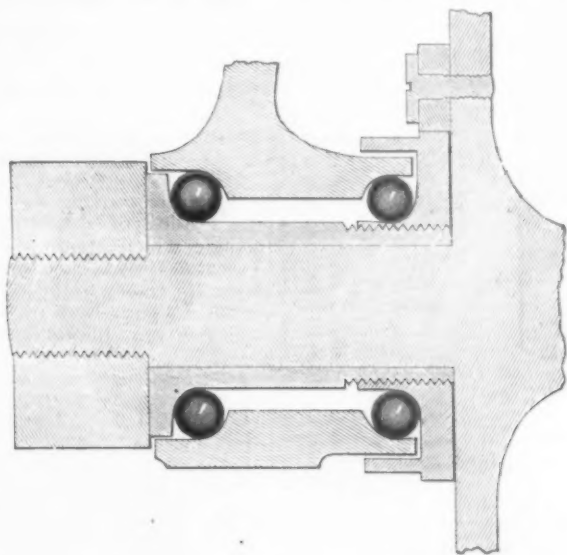


Fig. 1.—Ball Bearings of Springfield Roadster, 1888 Pattern.

two patterns is identical, those who purchase the \$75 wheel can have the ball bearings added at any time by paying the additional cost. The company allude to the fact that the 1888 pattern has as perfect an anti-friction bearing as it is possible to make, and in their catalogue de-

fervor of its embrace. Iron filings, slightly warmed, burst into brilliant scintillations when exposed to it; manganese does the same. Even the noble metals, which even at a melting heat proudly resist the fascinations of oxygen, succumb to this chemical siren at moderate temperatures. Glass is devoured at once and water ceases to be water by contact with this gas, which, combining with its hydrogen, at the same moment forms the acrid, glass-dissolving hydrofluoric acid and liberates ozone.

Improved Adjustable Arbor.

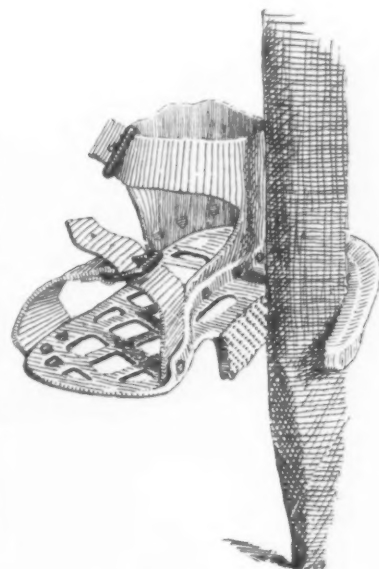
The accompanying cut shows a new adjustable saw and emery-wheel arbor, which is put on the market by Frasse & Co., 92 Park Row, New York. The advantages claimed for this tool are the ease with which saws or emery-wheels can be held with the certainty of having them run true; that by its use various diameters can be fastened thereon and each have a bearing on the arbor from side to side and not on one edge of the hole only, as is the case when conical bearings are used. Taking No. 1 as an example, the illustration shows the arbor with shell on for holding wheels of $\frac{1}{4}$ -inch bore. By taking off the piece and replacing it reversed, it will slide into a recess $\frac{1}{4}$ -inch diameter, which is turned into the fixed flange, allowing the shell to



Fig. 2.—From Springfield Roadster, 1888 Pattern.

scribing these machines they allude also to the other advantages possessed by them.

Isolation of Fluorine.—Three things were sought by the ancient alchemist—the philosopher's stone, the elixir of life, and the universal solvent. The last of these, though long known to modern chemistry, has just been separated, but cannot be retained, simply because it attacks or de-



Pole-Driving Attachment.

phor bronze or steel. We understand that Mr. Peters is willing to dispose of rights to manufacture this article.

The device for splitting the notches on the quadrant of a locomotive reversing lever, known as the May double latch, has been adopted by the roads composing the Cincinnati, New Orleans and Texas Pacific system, and is also being tried on ten engines on the Chesapeake and Ohio, six on the Richmond and Danville, four on the

Pennsylvania and three on the Canadian Pacific and Lake Shore and Michigan Southern. It is also being applied to several engines building at the Cooke Locomotive Works.

Universal Door Hanger.

This new door hanger, which is manufactured by the Moore Mfg. Company, 51 and 53 Franklin street, Chicago, is designed to avoid as much friction as possible. Its construction is simple and requires no extended description. The straps

other inclined surface; that a cube of the standard contains a greater quantity than the usual shapes, and that the corners are not as liable to break off. The quality of the chalk is also alluded to, being described as free from grit and not liable to cut a line.

A number of projects are contemplated this year in Chicago which will require a great deal of iron and steel. Among them are the cabling of the west side system of street railways, the construction of one elevated railway, and perhaps two others,

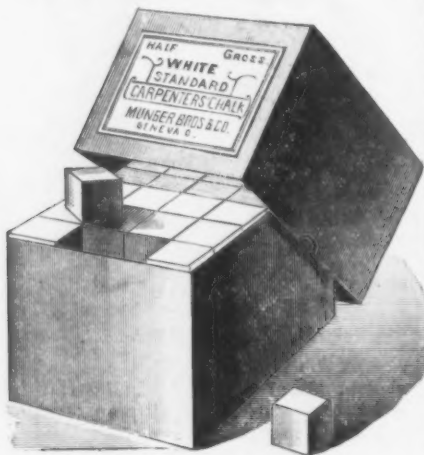


The Universal Door Hanger.

are of steel, $1\frac{1}{4} \times \frac{1}{4}$ inch, the slots are of malleable iron with $\frac{1}{8}$ inch bearings, and the axle is of steel with a 5-inch wheel.

Carpenter's Chalk.

Munger Bros. & Co., Geneva, Ohio, are putting on the market a line of prepared chalk, which is represented in the accompanying illustration. This chalk is prepared for use in the shape of a cube instead of the old style shape of a half sphere, and the manner in which it is put up is shown



Carpenter's Chalk in Cubes.

in the cut, the chalk being packed in one-half gross boxes. The following advantages are claimed: That the shape permits the packing of the chalk in smaller boxes, taking less room on the dealers' shelves; that it is not as liable to roll on a roof or

and the building of a number of viaducts over steam railways for the safe passage of pedestrians and vehicles. The improved systems of cabling street railways which are now in use require a large amount of iron and steel to secure the needed stability and rigidity. Stationary engines of large size also have to be provided for motive power, which will give work to engine builders. It is proposed to do away with horses on many of the feeders to the cable lines as soon as a satisfactory motor can be found, which may be either electric, steam or compressed air, and a further consumption of iron and steel is possible in this direction. The elevated railways will likewise need an extensive equipment of rolling stock. Some of the viaducts to be built are of great length, and will be the object of keen competition among bridge builders. The present seems to be a very good time for such undertakings, not only in Chicago, but elsewhere, as prices of iron and steel are low, and engineering establishments are not likely to be driven with work as much as they have been for the past two years.

The directors of the Tennessee Coal, Iron and Railroad Company, in order to provide for a floating indebtedness of \$400,000, propose to take up \$1,000,000 of common stock and issue in its place \$1,000,000 of preferred stock, guaranteed by the directors. The basis of the exchange is to be one-third of the par value of the common for par of the preferred. It is expected that in this manner from \$600,000 to \$700,000 will be raised, which will be used to extinguish the floating debt and leave a balance of \$200,000 to \$300,000 of capital. This, it is urged, will make it possible to apply current earnings to the payment of dividends.

Wash-Boiler Former.

A. Wilbraham, of Poquonock, Conn., is introducing a wash-boiler former, the features of which will be understood by reference to the accompanying engraving. The former consists of a bed-plate with a suitable peg on the underside to fit into a bench plate. There is also a former block with bands around the same, and a clamp



Wilbraham's Wash-Boiler Former.

operated by a screw crank for holding the body of the boiler to be formed against the bands. The desired width of boiler is attained by adding or removing the bands as the case may be. We understand the maker to say that wash-boilers can be formed on this device in one-quarter of the time that is necessary in the use of rolls. It also gives the boilers the correct shape and does not mar the metal in any way.

Eastlake Shingle.

The accompanying engravings illustrate the features of a new form of metallic shingle which Montross & McCurdy, of Toronto, Canada, are putting upon the market. Owing to the peculiar formation of the design it has been termed the Eastlake pattern. Sheets 20 x 28 in size are

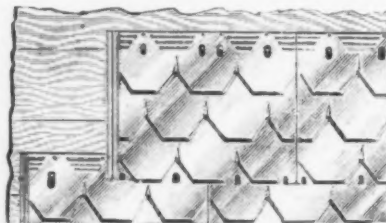


Fig. 1.—General Appearance of Roof.

used in the manufacture, and the forms of nine shingles are included in a single plate. Three occur in the upper row, three in the lower row, with two complete shingles and two half shingles in the middle row. The flange is of the interlocking order, and is of the form shown in Fig. 2 of the engravings. The overlapping of individual shingles is made by horizontal grooves,



Fig. 2.—Cross Section Through Side Seam.

as shown in the larger cut, and also by cleats which are adapted to bend over and hold down the edge of the overlapping piece. Joints are broken, as will be seen by the cut. We have samples of this shingle before us as we write, and they would seem to be well adapted for covering large spaces, and to be laid with a small amount of labor. The cleats which hold down the lower edge of the overlapping plates are riveted in position, and are adapted to be bent over and back against the surface they are to hold. This shingle has been manufactured for some time in Canada, but we believe it has not yet been introduced into the United States.

The new engines of the Boston and Albany Railroad carry 175 pounds pressure.

CURRENT HARDWARE PRICES.

APRIL 25, 1888.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.

Caps, Percussion, 7000—

| | |
|---|------|
| Edwards & Goldmark's | |
| F. L. Waterproof, 1-10's | 50¢ |
| E. B. Trimmer Edge, 1-10's | 55¢ |
| E. B. Ground Edge, Central Fire, 1-10's | 70¢ |
| Double Waterproof, 1-10's | 1.40 |
| Market Waterproof, 1-10's | 1.40 |
| G. D. | 35¢ |
| S. B. | 30¢ |

Union Metallic Cartridge Co.

| | |
|-----------------------------------|------|
| F. C. Trimmer | 50¢ |
| F. L. Ground | 55¢ |
| Cent. Fire Ground | 70¢ |
| Double Waterproof | 1.40 |
| Double Waterproof, 1-10's | 1.40 |
| 1. B. Genuine Imported | 45¢ |
| 2. B. E. B. | 54¢ |
| 3. B. D. Waterproof, Central Fire | 1.60 |

Cartridges—

| | |
|--|------------------|
| Rim Fire Cartridges | dis 50¢ & 52¢ |
| Rim Fire Military Cartridges | dis 15¢ & 2¢ |
| Cent. Fire Cartridges, Pistol and Rifle | dis 25¢ & 2¢ |
| Cent. Fire Cartr. Military & Sporting | dis 15¢ & 2¢ |
| Blank Cartridges, except 22 and 32 cal., an additional 10¢ over above discounts. | |
| Blank Cartridges 22 cal. | dis 1.75, dis 2¢ |
| Blank Cartridges, 32 cal. | dis 3.50, dis 2¢ |
| Primed Shells and Bullets | dis 15¢ & 2¢ |
| R. B. Caps, Round Ball | dis 1.75, dis 2¢ |
| R. B. Caps, Conical Ball, Swaged | dis 2.00, dis 2¢ |

Primers—

| | |
|--|------------------|
| Berdan Primers all sizes, and B. L. Caps (for Sturtevant Shells) | dis 1.00, dis 2¢ |
| All other Primers, all sizes | dis 1.30, dis 2¢ |

Shells—

| | |
|---|--------------------|
| First quality, 4, 8, 10 and 12 gauge | dis 25¢ & 10¢ & 2¢ |
| First quality, 14, 16 and 20 gauge (10 list) | dis 30¢ & 10¢ & 2¢ |
| Star, Club, Rival and 10-gauge, 30 list | dis 33¢ & 10¢ |
| Climax Brands, 12-gauge, 35 list | dis 33¢ & 10¢ |
| Club, Rival and Climax Brands 14, 16 and 20 gauge | dis 30¢ & 10¢ & 2¢ |
| Selbold's Combination Shot Shells | dis 15¢ & 2¢ |
| Brass Shot Shells, 1st quality | dis 60¢ & 2¢ |
| Brass Shot Shells, Club, Rival & Climax | dis 65¢ & 2¢ |

Shells Loaded—

| | |
|----------------------------------|---------------|
| List No. 10, 1887 | dis 20¢ & 10¢ |
| J. M. C. & W. R. A.—R. E., 11 up | dis 2.00 |
| M. C. & W. R. A.—R. E., 9¢ 10 | dis 2.30 |
| M. C. & W. R. A.—R. E., 7¢ 8 | dis 2.60 |
| M. C. & W. R. A.—P. E., 11 up | dis 3.10 |
| M. C. & W. R. A.—P. E., 9¢ 10 | dis 4.00 |
| M. C. & W. R. A.—P. E., 7¢ 8 | dis 4.90 |
| Elroy's B. E., 11 up | dis 1.75 |
| Elroy's P. E., 11 up | dis 2.80 |

Anvils—

| | |
|-------------------------------|--------------------------|
| Wright's—Eagle Anvils | dis 10¢, dis 20¢ & 20¢ 5 |
| Armstrong's Mouse Hole | dis 9¢ |
| Armstrong's Mouse Hole, Extra | dis 11¢ & 11¢ 5 |
| Trenton | dis 9¢ & 9¢ 5 |
| Wilkinson's | dis 9¢ & 9¢ 5 |
| J. & Riley Carr. Patent Solid | dis 11¢ & 11¢ 5 |

Swivel Vise and Drill—

| | |
|-------------------------------|--------------------|
| Wright's Falls Co. | dis 18.00, dis 20¢ |
| Cheney Anvil and Vise | dis 25¢ |
| Allen Combined Anvil and Vise | dis 40¢ & 10¢ |
| Moore & Barnes Mfg. Co. | dis 33¢ 5 |

Augers and Bits.

| | |
|--|-----------------------------|
| Douglas Mfg. Co. | |
| New Haven Copper Co. | |
| Wm. A. Ives & Co. | dis 70¢ & 70¢ 5 |
| Humphreysville Mfg. Co. | |
| French, Swift & Co. (F. H. Beecher) | dis 55¢ |
| Cook's, Douglas Mfg. Co. | dis 50¢ & 10¢ & 50¢ & 10¢ 5 |
| Cook's, New Haven Copper Co. | dis 50¢ & 10¢ & 50¢ & 10¢ 5 |
| Ives' Circular Lip | dis 60¢ |
| Patent Solid Head | dis 30¢ |
| C. E. Jennings & Co., No. 10, extension lip | dis 40¢ |
| C. E. Jennings & Co., No. 30 | dis 60¢ |
| C. E. Jennings & Co., Auger Bits, in fancy boxes | dis 20¢ |
| Set, 32¢ quarter, No. 5, 10; No. 3, 2 | dis 45¢ |
| Lewis' Patent Single Twist | dis 25¢ |
| Russell Jennings' Augers and Bits | dis 60¢ & 2¢ 5 |
| Imitation Jennings' Bits (new list) | dis 20¢ |
| Pugh's Black | dis 20¢ |
| Car Bit | dis 50¢ & 10¢ & 60¢ |
| L'Hommedieu Car Bit | dis 15¢ & 10¢ |
| Fortner Pat. Auger Bits | dis 10¢ |
| Hollow Augers— | |
| Ives | dis 25¢ & 10¢ |
| French, Swift & Co. | dis 25¢ & 10¢ 5 |
| Douglas | dis 25¢ & 10¢ 5 |
| Bonney's Adjustable | dis 45¢ |
| Stearns | dis 20¢ & 10¢ |
| Ives' Expansive, each \$4.50 | dis 50¢ & 10¢ |
| Universal Expansive, each \$4.50 | dis 20¢ |
| Wood's | dis 25¢ & 25¢ & 10¢ |

Expansive Bits—

| | |
|---------------------------------|-------------------------|
| Clark's small, 18; large, 30 | dis 35¢ & 35¢ 5 |
| Ives' No. 4, per doz, 600 | dis 35¢ & 40¢ |
| Swan's | dis 40¢ |
| Stearns' No. 1, 225; No. 2, 225 | dis 35¢ |
| Stearns' No. 3, 415 | dis 30¢ |
| Gimlet Bits— | |
| Common | dis 25¢ & 25¢ & 3.25 |
| Diamond | dis 1.10, dis 25¢ & 10¢ |
| "See" | dis 25¢ & 25¢ 5 |
| Double Cut, Shearwater | dis 45¢ & 45¢ 5 |
| Double Cut, Ct. Valley Mfg. Co. | dis 30¢ & 10¢ |
| Double Cut, Hartwell's, 7 gro. | dis 25¢ |
| Double Cut, Douglas | dis 40¢ & 10¢ |
| Double Cut, Ives | dis 60¢ & 60¢ 5 |

Bit Stock Drills—

| | |
|-------------------------------------|---------------------|
| Morse Twist Drills | dis 50¢ & 10¢ 5 |
| Standard | dis 50¢ & 10¢ 5 |
| Cleveland | dis 50¢ & 10¢ 5 |
| Syracuse, for metal | dis 50¢ & 10¢ 5 |
| Syracuse, for wood (wood list) | dis 30¢ & 30¢ 5 |
| Williams' or Holt's, for metal | dis 50¢ & 10¢ & 10¢ |
| Williams' or Holt's, for wood | dis 40¢ & 10¢ |
| Ship Augers and Bits— | |
| L'Hommedieu's | dis 15¢ & 10¢ |
| Watrous's | dis 15¢ & 10¢ |
| Snell's | dis 15¢ & 10¢ |
| Snell's Ship Auger Pattern Car Bits | dis 15¢ & 10¢ |

Awl Hatts.

| | |
|------------------------|--------------------------------|
| Sewing, Brass Ferrule | dis 1.50 5 gross—dis 45¢ & 10¢ |
| Patent Sewing, Short | dis 1.00 5 gross—dis 40¢ & 10¢ |
| Patent Sewing, Long | dis 1.20 5 gross—dis 40¢ & 10¢ |
| Patent Peg Plain Top | dis 1.00 5 gross—dis 45¢ & 10¢ |
| Patent Peg Leather Top | dis 1.20 5 gross—dis 45¢ & 10¢ |

Awls, Brad Sets, &c.

| | |
|-----------------------|--------------------------------|
| Awls, Sewing, Common | dis 1.70—dis 35¢ |
| Awls, Shouldered Peg | dis 2.50—dis 40¢ & 10¢ |
| Awls, Patent Peg | dis 2.50—dis 40¢ & 10¢ |
| Awls, Shouldered Brad | dis 2.70 5 gross—dis 35¢ |
| Awls, Handled Brad | dis 2.70 5 gross—dis 45¢ |
| Awls, Handled Scratch | dis 2.70 5 gross—dis 35¢ & 10¢ |
| Awls, Socket Scratch | dis 1.50 5 gross—dis 25¢ & 30¢ |

Awls and Tool Sets.

| | |
|---|------------------------|
| Allen's Sets, Awls & Tools, No. 20, 200 | dis 1.10—dis 50¢ & 10¢ |
| Fray's Ad Tool Hds., Nos. 1, 12; 2, 12; 3, 12; 4, 8 | dis 25¢ & 25¢ & 10¢ |
| Miller's Falls Adj. Tool Hds., Nos. 1, 12; 2, 12; 3, 12; 4, 8 | dis 25¢ & 25¢ & 10¢ |
| Henry's Combination Hds. | dis 25¢ & 10¢ |
| Brad Sets, No. 42, 10.50, No. 45, 12.50 | dis 70¢ & 10¢ 5 |
| Brad Sets, Stanley's Excelsior, No. 1, 7.50 | dis 30¢ & 10¢ |
| Brad Sets, Stanley's Excelsior, No. 2, 8.00 | dis 30¢ & 10¢ |
| Brad Sets, Stanley's Excelsior, No. 3, 8.50 | dis 30¢ & 10¢ |

Axes.

| | |
|-----------------------------|--------------------|
| Makers' and Special Brands— | |
| First quality | dis 25¢ & 25¢ & 50 |
| Others | dis 25¢ & 25¢ & 50 |

Axle Grease.

| | |
|--|----------------------|
| Fraser's, in bulk | Keg 5 4¢; Pall, 5 5¢ |
| Fraser's, in boxes | dis 25¢ & 25¢ & 50 |
| Dixon's Everlasting, in bxs. | dis 1.20; 2 2¢ |
| Dixon's Everlasting, 10-b pails, each, 85¢ | dis 1.00 |
| Lower grades, special brands | dis 50¢ & 50¢ |

Axles.—No. 1, 4¢ & 4¢ 5; No. 2, 5¢ & 5¢ 5.

| | |
|--|---------------------------|
| No. 7 to 18 | dis 40¢ & 10¢ & 50¢ |
| No. 19 to 25 | dis 60¢ & 10¢ & 60¢ & 10¢ |
| National Wrought Steel Tubular Self-Oiling | dis 33¢ 5 |
| Standard Farm (1 to 5) and Special Farm (A1 to A5) | dis 33¢ 5 |
| Less than 10 sets | dis 33¢ 5 |
| Over 10 sets | dis 33¢ 5 |
| X Strong Exp. (6 to 9), and XX Strong Truck (10 to 16) | dis 10¢ |
| Less than 10 sets | dis 10¢ |
| Over 10 sets | dis 10¢ 5 |

Bag Holders.

| | |
|--------------------------------------|------------------|
| Scrimley's Pat., 50¢ list | dis 60¢ |
| Balances.—Spring Balances | dis 50¢ |
| Common 2 1/2 | dis 1.50—dis 50¢ |
| Chatillon's Spring Balances | dis 50¢ |
| Chatillon's Circular Spring Balances | dis 60¢ |

Bells.

| | |
|-----------------------------------|---------------------|
| Light Brass | dis 70¢ & 10¢ |
| Extra Heavy | dis 60¢ & 10¢ |
| White Metal | dis 60¢ & 10¢ |
| Silver Chime | dis 25¢ & 10¢ 5 |
| Globe (Cone's Patent) | dis 25¢ & 10¢ & 35¢ |
| D or | |
| Gong, Abbe's | dis 25¢ & 10¢ & 35¢ |
| Gong, Yankee | dis 40¢ & 10¢ |
| Gong, Barton's | dis 40¢ & 10¢ & 50¢ |
| Crank, Taylor's | dis 50¢ & 10¢ |
| Crank, Brooks's | dis 50¢ & 10¢ 5 |
| Crank, Cone's | dis 50¢ & 10¢ 5 |
| Crank, Connel's | dis 20¢ & 10¢ |
| Lever, Sargent's | dis 60¢ & 10¢ |
| Lever, Taylor's Bronzed or Plated | dis 25¢ & 10¢ |
| Lever, Taylor's Japanese | dis 25¢ & 10¢ |
| Lever, R. E. W. Co.'s | dis 50¢ & 10¢ 5 |
| Pull, Hook's | dis 50¢ & 10¢ 5 |
| Pull, Westley's | dis 25¢ & 10¢ |

Cose.

| | |
|-------------------------------------|-----------------------------|
| Common Wrought | dis 60¢ & 10¢ |
| Western | dis 20¢ & 10¢ |
| Western, Sargent's list | dis 70¢ & 10¢ |
| Kentucky "Star" | dis 70¢ & 10¢ |
| Kentucky, Sargent's list | dis 70¢ & 10¢ |
| Dodge, Genuine Kentucky, new list | dis 70¢ & 10¢ |
| Texas Star | dis 50¢ & 10¢ & 50¢ & 10¢ 5 |
| Call | dis 40¢ & 40¢ 5 |
| Farm Bells | dis 2 3¢ & 3¢ 5 |
| Steel Alloy Church and School Bells | dis 40¢ |

Bellows.—Blacksmiths.

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|--------------|---------------------|
| Molders | dis 40¢ & 10¢ & 50¢ |
| Hand Bellows | dis 4 10¢ & 10¢ |

Belting, Rubber.

| | |
|-------------------------------|-----------------|
| Common Standard | dis 75¢ |
| Standard | dis 70¢ 5 |
| Extra | dis 60¢ & 10¢ |
| N. Y. & P. Co. Standard | dis 60¢ & 10¢ |
| N. Y. & P. Co. Extra Standard | dis 50¢ & 10¢ 5 |

Bench Stops.

| | |
|---------------------------------------|---------------------------|
| Morrill's | dis 50¢ & 50¢ |
| Horchik's | dis 50¢ & 10¢ & 10¢ & 10¢ |
| Weston's, per doz No. 1, 10; No. 2, 8 | dis 25¢ & 10¢ 5 |
| McGill's | dis 35¢—dis 10¢ |

Bits.—Auger, Gimlet Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders.

| | |
|---------------------|-------------------------|
| Extension, Barber's | dis 15.00—dis 40¢ & 10¢ |
| Extension, Ives | dis 20.00—dis 60¢ & 10¢ |
| Diagonal | dis 24.00—dis 40¢ |
| Angular | dis 24.00—dis 40¢ 5 |

Blind Adjusters.

| | |
|-------------------------|---------------------------|
| Domestic | dis 3.00—dis 83¢ |
| Excelsior | dis 10.00—dis 50¢ & 10¢ 5 |
| Washburn's Self-Loading | dis 20¢ & 20¢ & 10¢ |

Blind Fasteners.

| | |
|---------------------------------------|---------------------------------|
| Macrell's | dis 25¢ & 25¢ & 20¢ & 20¢ & 10¢ |
| Van Sand's Screw Pattern | dis 15¢ 5 gross—dis 60¢ & 10¢ |
| Van Sand's Old Pattern | dis 15¢ 5 gross—dis 55¢ & 10¢ |
| Washburn's Old Pattern | dis 15¢ 5 gross—dis 55¢ & 10¢ |
| Washburn's Old Pattern, new list, net | dis 15¢ 5 gross—dis 55¢ & 10¢ |
| Austin & Eddy No. 2008 | dis 15¢ 5 gross—dis 55¢ & 10¢ |
| Security Gravity | dis 15¢ 5 gross—dis 55¢ & 10¢ |

Blind Staples.

| | |
|----------------------------|---------------------|
| Barbed, 1/2 in. and larger | dis 8 1/2¢ & 9 1/2¢ |
| Barbed, 1/2 in. and larger | dis 8 1/2¢ & 9 1/2¢ |

Blocks.

| | |
|-------------------------------------|-----------------|
| Ordinary Tackle, list April 17, '85 | dis 40¢ & 40¢ 5 |
| Cleveland Block Co., Mal. Iron | dis 50¢ |

Bolts.

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|---|---------------------|
| Door and Shutter— | |
| Cast Iron Barrel, Square, &c. | dis 70¢ & 70¢ & 10¢ |
| Cast Iron Shutter Bolts | dis 70¢ & 70¢ & 10¢ |
| Cast Iron Chain (Sargent's list) | dis 60¢ & 10¢ |
| Ives' Patent Door Bolts | dis 55¢ |
| Wrought Barrel | dis 70¢ & 70¢ & 10¢ |
| Wrought Square | dis 70¢ & 70¢ & 10¢ |
| Wrought Shutter, all Iron, Stanley's list | dis 60¢ & 10¢ |
| Wrought Shutter, Brass Knob, Stanley's list | dis 40¢ & 10¢ |
| Wrought Shutter, Sargent's list | dis 60¢ & 10¢ |
| Wrought Sunk Flush, Sargent's list | dis 55¢ & 10¢ |
| Wrought Sunk Flush, Stanley's list | dis 40¢ & 10¢ 5 |
| Wrought R. E. Flush, Com'n Stanley's list | dis 55¢ & 10¢ |

Carriage—

| | |
|-------------------------------|-----------------|
| Com. list June 10, '85 | dis 70¢ & 10¢ 5 |
| Genuine Eagle, list Oct. '84 | dis 75¢ & 75¢ 5 |
| Phila. pattern, list Oct. '84 | dis 75¢ & 75¢ 5 |
| R. B. & W. old list | dis 70¢ |

Tire—

| | |
|--|---------------|
| Common, list Feb. 28, 1883 | dis 65¢ & 10¢ |
| P. C. B. & N. Co., Empire, list Feb. 28, 1883 | dis 65¢ & 10¢ |
| P. C. B. & N. Co., Philadel., list Oct. '84 | dis 82¢ 5 |
| P. C. B. & N. Co., Keystone, Phil. list Oct. '84 | dis 80¢ |
| P. C. B. & N. Co., Norway, Phil. list Oct. '84 | dis 75¢ & 10¢ |
| Am. S. Co., Norway, Phil. list Oct. '84 | dis 75¢ & 10¢ |
| Am. S. Co., Eagle, Phil. list Oct. '84 | dis 80¢ |
| Am. S. Co., Philadel., list Oct. '84 | dis 82¢ 5 |
| Am. S. Co., Bay State, list Feb. 28, '83 | dis 45¢ & 10¢ |
| R. B. & W. Philadel., list Oct. 17, 1884 | dis 82¢ |
| R. E. Mfg. Co. | dis 65¢ |

Stove and Plow—

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|----------------------------|-----------------|
| Stove | dis 62¢ 5 |
| Plow | dis 60¢ 5 |
| Am. S. Co. Stove, Annealed | dis 55¢ |
| R. B. & W. Plow | dis 62¢ 5 |
| R. E. Mfg. Co. Stove | dis 62¢ 5 |
| Machine | dis 75¢ & 75¢ 5 |
| Bolt Ends | dis 75¢ & 75¢ 5 |
| Borax | dis 9¢ & 10¢ 5 |

Boring Machines.

| | |
|----------------------------------|---------------------|
| Without Augers | |
| Douglas | dis 50¢ |
| Snell's, Rice's Patent | dis 60¢ & 10¢ & 10¢ |
| Jennings | dis 50¢ |
| Other Machines | dis 50¢ & 10¢ |
| Phillips' Pat., with Augers 7 00 | dis 75¢ |

Saw Pins.

| | |
|--------------------------|-------------------------------|
| Humason, Beckley & Co.'s | dis 60¢ & 10¢ |
| Sargent & Co.'s | dis 60¢ & 10¢ |
| Peck, Stow & W. Co. | dis 50¢ & 10¢ & 50¢ & 10¢ 5</ |

Pennsylvania...dis 40x105
Nos. 1 2 3 4 5 6 7 8 9 10
Files Chalmers...dis 40x105
Home No. 1...dis 40x105
Draw Cut...dis 40x105
Beef Shavers...dis 40x105
Chadborn's Smoked Beef Cutter...dis 40x105

Mining Knives.
Am. (2d quality), 7 gro, 1 blade, 77; 2 blades, 112; 3 blades, 118.
Smith's, 7 doz, Single, 22.00; Double, 27.00; dis 40x105
Lodrop's, 7 doz, Single, 22.00; Double, 27.00; dis 40x105
Buffalo Adjustable...dis 40x105

Melanes Gages.—Stebbins Pat. dis 70x70 & 75x75
Stebbins Genuine...dis 60x10x10
Stebbins Tinned Ends...dis 40x10
Chase's Hard Metal...dis 60x10
Bush's...dis 20x10
Lincoln's Pattern...dis 60x10
Wood's...dis 20x10

Money Drawers.—7 doz, dis 60x10x10
Muzzles.—Safety, 7 doz, dis 25x5

Nails.—See Trade Report
Wire Nails and Brads, list July 14, '87, dis 70x
Wire Nails, Standard Penny...dis 70x
Nail Puller.—Jurtiss Hammer...dis 20x20 net

Nail Puller.—Jurtiss Hammer...dis 20x20 net
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Nail Puller.—Jurtiss Hammer...dis 20x20 net

Nut Crackers.
Table Hummer & Beckley Mfg. Co., dis 40x10
Blake's Pattern...dis 40x10
Farmer & Seymour Mfg. Co., dis 40x10

Nuts and Washers.
Size...dis 1/2 3/4 1 1 1/2 1 3/4 2 2 1/2 3 3 1/2 4 4 1/2 5 5 1/2 6 6 1/2 7 7 1/2 8 8 1/2 9 9 1/2 10 10 1/2 11 11 1/2 12 12 1/2 13 13 1/2 14 14 1/2 15 15 1/2 16 16 1/2 17 17 1/2 18 18 1/2 19 19 1/2 20 20 1/2 21 21 1/2 22 22 1/2 23 23 1/2 24 24 1/2 25 25 1/2 26 26 1/2 27 27 1/2 28 28 1/2 29 29 1/2 30 30 1/2 31 31 1/2 32 32 1/2 33 33 1/2 34 34 1/2 35 35 1/2 36 36 1/2 37 37 1/2 38 38 1/2 39 39 1/2 40 40 1/2 41 41 1/2 42 42 1/2 43 43 1/2 44 44 1/2 45 45 1/2 46 46 1/2 47 47 1/2 48 48 1/2 49 49 1/2 50 50 1/2 51 51 1/2 52 52 1/2 53 53 1/2 54 54 1/2 55 55 1/2 56 56 1/2 57 57 1/2 58 58 1/2 59 59 1/2 60 60 1/2 61 61 1/2 62 62 1/2 63 63 1/2 64 64 1/2 65 65 1/2 66 66 1/2 67 67 1/2 68 68 1/2 69 69 1/2 70 70 1/2 71 71 1/2 72 72 1/2 73 73 1/2 74 74 1/2 75 75 1/2 76 76 1/2 77 77 1/2 78 78 1/2 79 79 1/2 80 80 1/2 81 81 1/2 82 82 1/2 83 83 1/2 84 84 1/2 85 85 1/2 86 86 1/2 87 87 1/2 88 88 1/2 89 89 1/2 90 90 1/2 91 91 1/2 92 92 1/2 93 93 1/2 94 94 1/2 95 95 1/2 96 96 1/2 97 97 1/2 98 98 1/2 99 99 1/2 100 100 1/2 101 101 1/2 102 102 1/2 103 103 1/2 104 104 1/2 105 105 1/2 106 106 1/2 107 107 1/2 108 108 1/2 109 109 1/2 110 110 1/2 111 111 1/2 112 112 1/2 113 113 1/2 114 114 1/2 115 115 1/2 116 116 1/2 117 117 1/2 118 118 1/2 119 119 1/2 120 120 1/2 121 121 1/2 122 122 1/2 123 123 1/2 124 124 1/2 125 125 1/2 126 126 1/2 127 127 1/2 128 128 1/2 129 129 1/2 130 130 1/2 131 131 1/2 132 132 1/2 133 133 1/2 134 134 1/2 135 135 1/2 136 136 1/2 137 137 1/2 138 138 1/2 139 139 1/2 140 140 1/2 141 141 1/2 142 142 1/2 143 143 1/2 144 144 1/2 145 145 1/2 146 146 1/2 147 147 1/2 148 148 1/2 149 149 1/2 150 150 1/2 151 151 1/2 152 152 1/2 153 153 1/2 154 154 1/2 155 155 1/2 156 156 1/2 157 157 1/2 158 158 1/2 159 159 1/2 160 160 1/2 161 161 1/2 162 162 1/2 163 163 1/2 164 164 1/2 165 165 1/2 166 166 1/2 167 167 1/2 168 168 1/2 169 169 1/2 170 170 1/2 171 171 1/2 172 172 1/2 173 173 1/2 174 174 1/2 175 175 1/2 176 176 1/2 177 177 1/2 178 178 1/2 179 179 1/2 180 180 1/2 181 181 1/2 182 182 1/2 183 183 1/2 184 184 1/2 185 185 1/2 186 186 1/2 187 187 1/2 188 188 1/2 189 189 1/2 190 190 1/2 191 191 1/2 192 192 1/2 193 193 1/2 194 194 1/2 195 195 1/2 196 196 1/2 197 197 1/2 198 198 1/2 199 199 1/2 200 200 1/2 201 201 1/2 202 202 1/2 203 203 1/2 204 204 1/2 205 205 1/2 206 206 1/2 207 207 1/2 208 208 1/2 209 209 1/2 210 210 1/2 211 211 1/2 212 212 1/2 213 213 1/2 214 214 1/2 215 215 1/2 216 216 1/2 217 217 1/2 218 218 1/2 219 219 1/2 220 220 1/2 221 221 1/2 222 222 1/2 223 223 1/2 224 224 1/2 225 225 1/2 226 226 1/2 227 227 1/2 228 228 1/2 229 229 1/2 230 230 1/2 231 231 1/2 232 232 1/2 233 233 1/2 234 234 1/2 235 235 1/2 236 236 1/2 237 237 1/2 238 238 1/2 239 239 1/2 240 240 1/2 241 241 1/2 242 242 1/2 243 243 1/2 244 244 1/2 245 245 1/2 246 246 1/2 247 247 1/2 248 248 1/2 249 249 1/2 250 250 1/2 251 251 1/2 252 252 1/2 253 253 1/2 254 254 1/2 255 255 1/2 256 256 1/2 257 257 1/2 258 258 1/2 259 259 1/2 260 260 1/2 261 261 1/2 262 262 1/2 263 263 1/2 264 264 1/2 265 265 1/2 266 266 1/2 267 267 1/2 268 268 1/2 269 269 1/2 270 270 1/2 271 271 1/2 272 272 1/2 273 273 1/2 274 274 1/2 275 275 1/2 276 276 1/2 277 277 1/2 278 278 1/2 279 279 1/2 280 280 1/2 281 281 1/2 282 282 1/2 283 283 1/2 284 284 1/2 285 285 1/2 286 286 1/2 287 287 1/2 288 288 1/2 289 289 1/2 290 290 1/2 291 291 1/2 292 292 1/2 293 293 1/2 294 294 1/2 295 295 1/2 296 296 1/2 297 297 1/2 298 298 1/2 299 299 1/2 300 300 1/2 301 301 1/2 302 302 1/2 303 303 1/2 304 304 1/2 305 305 1/2 306 306 1/2 307 307 1/2 308 308 1/2 309 309 1/2 310 310 1/2 311 311 1/2 312 312 1/2 313 313 1/2 314 314 1/2 315 315 1/2 316 316 1/2 317 317 1/2 318 318 1/2 319 319 1/2 320 320 1/2 321 321 1/2 322 322 1/2 323 323 1/2 324 324 1/2 325 325 1/2 326 326 1/2 327 327 1/2 328 328 1/2 329 329 1/2 330 330 1/2 331 331 1/2 332 332 1/2 333 333 1/2 334 334 1/2 335 335 1/2 336 336 1/2 337 337 1/2 338 338 1/2 339 339 1/2 340 340 1/2 341 341 1/2 342 342 1/2 343 343 1/2 344 344 1/2 345 345 1/2 346 346 1/2 347 347 1/2 348 348 1/2 349 349 1/2 350 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517 517 1/2 518 518 1/2 519 519 1/2 520 520 1/2 521 521 1/2 522 522 1/2 523 523 1/2 524 524 1/2 525 525 1/2 526 526 1/2 527 527 1/2 528 528 1/2 529 529 1/2 530 530 1/2 531 531 1/2 532 532 1/2 533 533 1/2 534 534 1/2 535 535 1/2 536 536 1/2 537 537 1/2 538 538 1/2 539 539 1/2 540 540 1/2 541 541 1/2 542 542 1/2 543 543 1/2 544 544 1/2 545 545 1/2 546 546 1/2 547 547 1/2 548 548 1/2 549 549 1/2 550 550 1/2 551 551 1/2 552 552 1/2 553 553 1/2 554 554 1/2 555 555 1/2 556 556 1/2 557 557 1/2 558 558 1/2 559 559 1/2 560 560 1/2 561 561 1/2 562 562 1/2 563 563 1/2 564 564 1/2 565 565 1/2 566 566 1/2 567 567 1/2 568 568 1/2 569 569 1/2 570 570 1/2 571 571 1/2 572 572 1/2 573 573 1/2 574 574 1/2 575 575 1/2 576 576 1/2 577 577 1/2 578 578 1/2 579 579 1/2 580 580 1/2 581 581 1/2 582 582 1/2 583 583 1/2 584 584 1/2 585 585 1/2 586 586 1/2 587 587 1/2 588 588 1/2 589 589 1/2 590 590 1/2 591 591 1/2 592 592 1/2 593 593 1/2 594 594 1/2 595 595 1/2 596 596 1/2 597 597 1/2 598 598 1/2 599 599 1/2 600 600 1/2 601 601 1/2 602 602 1/2 603 603 1/2 604 604 1/2 605 605 1/2 606 606 1/2 607 607 1/2 608 608 1/2 609 609 1/2 610 610 1/2 611 611 1/2 612 612 1/2 613 613 1/2 614 614 1/2 615 615 1/2 616 616 1/2 617 617 1/2 618 618 1/2 619 619 1/2 620 620 1/2 621 621 1/2 622 622 1/2 623 623 1/2 624 624 1/2 625 625 1/2 626 626 1/2 627 627 1/2 628 628 1/2 629 629 1/2 630 630 1/2 631 631 1/2 632 632 1/2 633 633 1/2 634 634 1/2 635 635 1/2 636 636 1/2 637 637 1/2 638 638 1/2 639 639 1/2 640 640 1/2 641 641 1/2 642 642 1/2 643 643 1/2 644 644 1/2 645 645 1/2 646 646 1/2 647 647 1/2 648 648 1/2 649 649 1/2 650 650 1/2 651 651 1/2 652 652 1/2 653 653 1/2 654 654 1/2 655 655 1/2 656 656 1/2 657 657 1/2 658 658 1/2 659 659 1/2 660 660 1/2 661 661 1/2 662 662 1/2 663 663 1/2 664 664 1/2 665 665 1/2 666 666 1/2 667 667 1/2 668 668 1/2 669 669 1/2 670 670 1/2 671 671 1/2 672 672 1/2 673 673 1/2 674 674 1/2 675 675 1/2 676 676 1/2 677 677 1/2 678 678 1/2 679 679 1/2 680 680 1/2 681 681 1/2 682 682 1/2 683 683 1/2 684 684 1/2 685 685 1/2 686 686 1/2 687 687 1/2 688 688 1/2 689 689 1/2 690 690 1/2 691 691 1/2 692 692 1/2 693 693 1/2 694 694 1/2 695 695 1/2 696 696 1/2 697 697 1/2 698 698 1/2 699 699 1/2 700 700 1/2 701 701 1/2 702 702 1/2 703 703 1/2 704 704 1/2 705 705 1/2 706 706 1/2 707 707 1/2 708 708 1/2 709 709 1/2 710 710 1/2 711 711 1/2 712 712 1/2 713 713 1/2 714 714 1/2 715 715 1/2 716 716 1/2 717 717 1/2 718 718 1/2 719 719 1/2 720 720 1/2 721 721 1/2 722 722 1/2 723 723 1/2 724 724 1/2 725 725 1/2 726 726 1/2 727 727 1/2 728 728 1/2 729 729 1/2 730 730 1/2 731 731 1/2 732 732 1/2 733 733 1/2 734 734 1/2 735 735 1/2 736 736 1/2 737 737 1/2 738 738 1/2 739 739 1/2 740 740 1/2 741 741 1/2 742 742 1/2 743 743 1/2 744 744 1/2 745 745 1/2 746 746 1/2 747 747 1/2 748 748 1/2 749 749 1/2 750 750 1/2 751 751 1/2 752 752 1/2 753 753 1/2 754 754 1/2 755 755 1/2 756 756 1/2 757 757 1/2 758 758 1/2 759 759 1/2 760 760 1/2 761 761 1/2 762 762 1/2 763 763 1/2 764 764 1/2 765 765 1/2 766 766 1/2 767 767 1/2 768 768 1/2 769 769 1/2 770 770 1/2 771 771 1/2 772 772 1/2 773 773 1/2 774 774 1/2 775 775 1/2 776 776 1/2 777 777 1/2 778 778 1/2 779 779 1/2 780 780 1/2 781 781 1/2 782 782 1/2 783 783 1/2 784 784 1/2 785 785 1/2 786 786 1/2 787 787 1/2 788 788 1/2 789 789 1/2 790 790 1/2 791 791 1/2 792 792 1/2 793 793 1/2 794 794 1/2 795 795 1/2 796 796 1/2 797 797 1/2 798 798 1/2 799 799 1/2 800 800 1/2 801 801 1/2 802 802 1/2 803 803 1/2 804 804 1/2 805 805 1/2 806 806 1/2 807 807 1/2 808 808 1/2 809 809 1/2 810 810 1/2 811 811 1/2 812 812 1/2 813 813 1/2 814 814 1/2 815 815 1/2 816 816 1/2 817 817 1/2 818 818 1/2 819 819 1/2 820 820 1/2 821 821 1/2 822 822 1/2 823 823 1/2 824 824 1/2 825 825 1/2 826 826 1/2 827 827 1/2 828 828 1/2 829 829 1/2 830 830 1/2 831 831 1/2 832 832 1/2 833 833 1/2 834 834 1/2 835 835 1/2 836 836 1/2 837 837 1/2 838 838 1/2 839 839 1/2 840 840 1/2 841 841 1/2 842 842 1/2 843 843 1/2 844 844 1/2 845 845 1/2 846 846 1/2 847 847 1/2 848 848 1/2 849 849 1/2 850 850 1/2 851 851 1/2 852 852 1/2 853 853 1/2 854 854 1/2 855 855 1/2 856 856 1/2 857 857 1/2 858 858 1/2 859 859 1/2 860 860 1/2 861 861 1/2 862 862 1/2 863 863 1/2 864 864 1/2 865 865 1/2 866 866 1/2 867 867 1/2 868 868 1/2 869 869 1/2 870 870 1/2 871 871 1/2 872 872 1/2 873 873 1/2 874 874 1/2 875 875 1/2 876 876 1/2 877 877 1/2 878 878 1/2 879 879 1/2 880 880 1/2 881 881 1/2 882 882 1/2 883 883 1/2 884 884 1/2 885 885 1/2 886 886 1/2 887 887 1/2 888 888 1/2 889 889 1/2 890 890 1/2 891 891 1/2 892 892 1/2 893 893 1/2 894 894 1/2 895 895 1/2 896 896 1/2 897 897 1/2 898 898 1/2 899 899 1/2 900 900 1/2 901 901 1/2 902 902 1/2 903 903 1/2 904 904 1/2 905 905 1/2 906 906 1/2 907 907 1/2 908 908 1/2 909 909 1/2 910 910 1/2 911 911 1/2 912 912 1/2 913 913 1/2 914 914 1/2 915 915 1/2 916 916 1/2 917 917 1/2 918 918 1/2 919 919 1/2 920 920 1/2 921 921 1/2 922 922 1/2 923 923 1/2 924 924 1/2 925 925 1/2 926 926 1/2 927 927 1/2 928 928 1/2 929 929 1/2 930 930 1/2 931 931 1/2 932 932 1/2 933 933 1/2 934 934 1/2 935 935 1/2 936 936 1/2 937 937 1/2 938 938 1/2 939 939 1/2 940 940 1/2 941 941 1/2 942 942 1/2 943 943 1/2 944 944 1/2 945 945 1/2 946 946 1/2 947 947 1/2 948 948 1/2 949 949 1/2 950 950 1/2 951 951 1/2 952 952 1/2 953 953 1/2 954 954 1/2 955 955 1/2 956 956 1/2 957 957 1/2 958 958 1/2 959 959 1/2 960 960 1/2 961 961 1/2 962 962 1/2 963 963 1/2 964 964 1/2 965 965 1/2 966 966 1/2

Syracuse Screw Driver Bits.....dis 30 & 30 1/2
Screw Driver Bits.....dis 50 & 75
Screw Driver Bits, Parr's.....dis 50
Fray's Hol. Hdl. Seta, No. 3, 112.....dis 25 & 10
P. D. & Co.'s, all Steel.....dis 50

Screws.
Wood Screws—List, Brass, Jan. 27; Iron, July 1, 1887
Flat Head Iron.....dis 70
Round Head Iron.....dis 65
Flat Head Brass.....dis 65
Round Head Brass.....dis 60
Flat Head Bronze.....dis 60
Round Head Bronze.....dis 60

Machin.
Flat Head, Iron.....dis 55
Round Head, Iron.....dis 50

Bench and Hand—
Bench, Iron.....dis 55 & 10 & 55 & 10 & 10
Bench, Wood, Beech.....dis 22 1/2
Bench, Wood, Hickory.....dis 20 & 10
Hand, Wood, Hickory.....dis 25 & 10 & 25 & 10 & 5
Laz. Blunt Point.....dis 70
Laz. and Log, Blunt Point.....dis 60
Bed.....dis 25 & 5
Hand Rail, Sargent's.....dis 60 & 10
Hand Rail, Humason, Beckley & Co.'s.....dis 70 & 10 & 75
Hand Rail, Am. Screw Co.....dis 75
Jack Screws, Millers Falls list.....dis 50 & 50 & 5
Jack Screws, P. S. & W.....dis 35
Jack Screws, Sargent's.....dis 60 & 10 & 60 & 10 & 5
Jack Screws, Stevens.....dis 40 & 40 & 10

Scroll Saws.
Lester, complete, \$10.00.....dis 25
Rosen, complete, \$4.00.....dis 25

Seythe Snaths......dis 50 & 10

Shears.
American (Cast) Iron.....dis 75 & 10 & 75 & 10 & 5
Pruning.....dis 20 & 25
Barnard's Lamp Trimmers.....dis 20 & 25
Timmer's.....dis 20 & 25
Seymour's, List, Dec. 1881 dis 60 & 10 & 60 & 10 & 5
Heinsch's, List, Dec. 1881, dis 60 & 10 & 60 & 10 & 5
Heinsch's Tailor's Shears.....dis 35
First quality C. S. Trimmers.....dis 80 & 10 & 80 & 10 & 5
Second quality C. S. Trimmers.....dis 80 & 10 & 80 & 10 & 5
Acme Cast Shears.....dis 10 & 10
Diamond Cast Shears.....dis 10
Clippers.....dis 10 & 10
Victor Cast Shears.....dis 70 & 10 & 75 & 10 & 5
Howe Bros. & Hubert, Solid Forged Steel.....dis 40
Cleveland Machine Co., Solid Steel Forged.....dis 70

Sliding Door—
M. W. & Co., List Jan. 1, 1887.....dis 60 & 10 & 60 & 10 & 5
R. & E. List, Dec. 18, 1885.....dis 55 & 25
Corbin's list.....dis 60 & 10 & 60 & 10 & 5
Patent Roller.....dis 60 & 10 & 60 & 10 & 5
Patent Roller, Hatfield's.....dis 75
Russell's Anti-Friction, list Dec. 18, 1885, dis 60 & 10
Moore's Anti-Friction.....dis 60

Sliding Shutter—
R. & E. List, Dec. 18, 1885.....dis 60 & 10 & 60 & 10 & 5
Sargent's list.....dis 60 & 10 & 60 & 10 & 5
Reading list.....dis 60 & 10 & 60 & 10 & 5

Ship Tools......dis 20 & 5

L. & J. J. White.....dis 20 & 5

Albertson Mfg. Co.....dis 25

Shoes, Horse, Mule, &c.

Horse—
Burden's, Perkins', Phoenix, at factory.....\$4.00
Mule—Add \$1 keg to above prices.

Oze, Wrought—
Ton lots.....dis 10
1000 lb lots.....dis 10
500 lb lots.....dis 10

Shot—(Eastern prices, 2¢ off, cash, 5 days.)
Drop, 25 bag, 25 lb.....\$1.50
Drop, 25 bag, 5 lb.....\$1.50
Ruck and Chilled, 25 lb bag.....\$1.75
Ruck and Chilled, 5 lb bag.....\$1.75

Shovels and Spades.
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....dis 30
Nortz—Jobbers frequently give 5 & 7 1/2% extra on above.

Griffin's Black Iron.....dis 50 & 10
Griffin's C. S.....dis 60 & 10 & 60 & 10 & 5
Common and Patent Brads.....dis 20
Old Colony (Sanford Fork & Tool Co.).....dis 20
St. Louis Shovel Co.....dis 15 & 15 & 7 1/2
Hussey, Blinn & Co.....dis 20 & 20 & 7 1/2
Hubbard & Co.....dis 20 & 20 & 7 1/2
Lehigh Mfg. Co.....dis 50 & 10
Payne Pettibone & Son, list January, 1886.....dis 30
Remington's (Lowman's Patent).....dis 30 & 10 & 40
Rowland's, Black Iron.....dis 50 & 10
Rowland's Steel.....dis 60 & 10 & 60 & 10 & 5

Shovels and Tongs.
Iron Head.....dis 60 & 10 & 60 & 10 & 5
Brass Head.....dis 60 & 10 & 60 & 10 & 5

Skins, Thimble.

Western list.....dis 75 & 75 & 10
Columbus Wrt. Steel, list Nov. 1, 1887.....dis 20
Coldbrookdale Iron Co.....dis 50 & 10

Sieves.

Buffalo Metallic, S. & Co., new list.....dis 50 & 25 & 10
Barier Flour Sifters.....dis 20 & 20
Smith's Adjustable Sifters.....dis 20 & 25
Smith's Adjustable Milk Strainer.....dis 20 & 20
Smith's Adjustable F. & C. Strainer.....dis 17 1/2
Siemens, Wooden Rim.....dis 10
Mesh 18, Nested, 70#.....dis 10
Mesh 20, Nested, 70#.....dis 10
Mesh 24, Nested, 70#.....dis 10
Slates—School, by case.....dis 50 & 10

Snaps, Harness, &c.

Anchor (P. & S. Mfg. Co.).....dis 60
Pto's (Bristol).....dis 50 & 10
Hotchkiss.....dis 10
Andrews.....dis 50
Sargent's Patent Guarded.....dis 70 & 10 & 10
German, new list.....dis 40 & 10
Covert.....dis 50
Covert, New Patent.....dis 50
Covert New R. E.....dis 60 & 2
Covered Spring.....dis 60 & 10 & 10

Soldering Irons.
Covert's Adjustable, list Jan. 1, 1886.....dis 35 & 5

Spoke Shaves—Iron......dis 45

Wood.....dis 30
Bailey's (Stanley R. & L. Co.).....dis 40 & 10
Stearns.....dis 20 & 10 & 30

Spoke Trimmers.

Bonney's.....dis 10 & 10, dis 50
Stearns.....dis 50 & 10
Ives' No. 1, \$15.00; No. 2, \$15.00; No. 3, \$15.00; No. 4, \$15.00; No. 5, \$15.00; No. 6, \$15.00; No. 7, \$15.00; No. 8, \$15.00; No. 9, \$15.00; No. 10, \$15.00; No. 11, \$15.00; No. 12, \$15.00; No. 13, \$15.00; No. 14, \$15.00; No. 15, \$15.00; No. 16, \$15.00; No. 17, \$15.00; No. 18, \$15.00; No. 19, \$15.00; No. 20, \$15.00; No. 21, \$15.00; No. 22, \$15.00; No. 23, \$15.00; No. 24, \$15.00; No. 25, \$15.00; No. 26, \$15.00; No. 27, \$15.00; No. 28, \$15.00; No. 29, \$15.00; No. 30, \$15.00; No. 31, \$15.00; No. 32, \$15.00; No. 33, \$15.00; No. 34, \$15.00; No. 35, \$15.00; No. 36, \$15.00; No. 37, \$15.00; No. 38, \$15.00; No. 39, \$15.00; No. 40, \$15.00; No. 41, \$15.00; No. 42, \$15.00; No. 43, \$15.00; No. 44, \$15.00; No. 45, \$15.00; No. 46, \$15.00; No. 47, \$15.00; No. 48, \$15.00; No. 49, \$15.00; No. 50, \$15.00; No. 51, \$15.00; No. 52, \$15.00; No. 53, \$15.00; No. 54, \$15.00; No. 55, \$15.00; No. 56, \$15.00; No. 57, \$15.00; No. 58, \$15.00; No. 59, \$15.00; 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CURRENT METAL PRICES.

APRIL 25, 1888.

IRON AND STEEL.

Bar Iron from Store.

| | |
|---|---------------------|
| Common Iron: | |
| ¾ to 2 in. round and square. | per lb 2.00 @ 2.10¢ |
| 1 to 6 in. x ¾ to 1 in. | |
| Refined Iron: | |
| ¾ to 2 in. round and square. | per lb 2.20 @ 2.30¢ |
| 1 to 4 in. x ¾ to 1 in. | |
| 4 ½ to 6 in. x ¾ to 1 in. | per lb 2.40 @ 2.50¢ |
| 1 to 6 in. x ¾ and 5-16 | per lb 2.50 @ 2.40¢ |
| Rods—¾ and 1-16 round and sq. | per lb 2.40 @ 2.50¢ |
| Bands 1 to 6 x 3-16 to No. 12. | per lb 3.00 @ 3.10¢ |
| "Harden Best" Iron, base price. | per lb 2.80 @ 2.90¢ |
| Burgen's "H. B. & S." Iron, base price. | per lb 2.80 @ 2.90¢ |
| "Ulster"..... | per lb 3.10 @ 3.20¢ |
| Norway Rods..... | per lb 4.00 @ 5.00¢ |

Merchant Steel from Store.

| | |
|---|------------|
| Open-Hearth and Bessemer Machinery, | Per pound. |
| Toe Calk, Tire and Sleigh Shoe, base price in small lots. | 38¢ @ 3¢ |
| Best Cast Steel, base price in small lots 9¢ | @ 10¢ |
| Best Cast Steel Machinery, base price in small lots | 53¢ @ 6¢ |

Extras on Merchant Steel.

For classification and extras adopted by the Merchant Steel Association of the United States January 11, 1888, see *The Iron Age*, Feb. 23, 1888.

Sheet Iron from Store.

| Common American. | R. G. Cleaned. |
|------------------|---------------------|
| 10 to 16..... | per lb 2.75 @ 2.80¢ |
| 17 to 20..... | per lb 2.85 @ 2.90¢ |
| 21 to 24..... | per lb 3.00 @ 3.10¢ |
| 25 and 26..... | per lb 3.20 @ 3.30¢ |
| 27..... | per lb 3.75 @ 3.85¢ |
| 28..... | per lb 3.50 @ 3.60¢ |

| Galvanized, 14 to 20..... | B. B. 2d qual. |
|-----------------------------|----------------------|
| Galvanized, 21 to 24..... | per lb 4.30¢ @ 4.50¢ |
| Galvanized, 25 to 26..... | per lb 5.20¢ @ 5.40¢ |
| Galvanized, 27..... | per lb 5.60¢ @ 5.80¢ |
| Galvanized, 28..... | per lb 6.00¢ @ 6.20¢ |
| Painted Finished..... | per lb 1.10¢ @ 1.20¢ |
| Russia..... | per lb 94¢ @ 10¢ |
| American Cold Rolled B..... | per lb 5¢ @ 7¢ |

English Steel from Store.

| | |
|------------------------------------|--------------|
| Best Cast..... | per lb 15¢ |
| Extra Cast..... | per lb 16¢ |
| Swaged, Cast..... | per lb 16¢ |
| Best Double Shear..... | per lb 15¢ |
| Blister, 1st quality..... | per lb 12 ½¢ |
| German Steel, Best..... | per lb 10¢ |
| 2d quality..... | per lb 9¢ |
| 3d quality..... | per lb 8¢ |
| Sheet Cast Steel, 1st quality..... | per lb 15¢ |
| 2d quality..... | per lb 14¢ |
| 3d quality..... | per lb 12 ½¢ |

METALS.

Tin.

| Banca, Pigs..... | per lb 38¢ @ 39 ½¢ |
|----------------------|--------------------|
| Straits, Pigs..... | per lb 37¢ |
| English, Pigs..... | per lb 36¢ |
| Straits in Bars..... | per lb 39¢ @ 40¢ |

Tin Plates.

| Charcoal Plates.—Bright. | Per box. |
|--------------------------|-----------------------|
| Melyn Grade..... | per box \$6.50 |
| IC, 10 x 14..... | per box 6.75 |
| IC, 12 x 12..... | per box 6.50 |
| IC, 14 x 20..... | per box 13.00 |
| IC, 20 x 28..... | per box 8.00 |
| IC, 12 x 12..... | per box 8.25 |
| IC, 14 x 20..... | per box 8.00 |
| IC, 20 x 28..... | per box 16.00 |
| DC, 12 ½ x 17..... | per box 6.00 |
| DX, 12 ½ x 17..... | per box 7.50 |
| Calland Grade..... | per box 6.10 |
| IC, 10 x 14..... | per box 6.25 |
| IC, 12 x 12..... | per box 6.00 |
| IC, 14 x 20..... | per box 7.50 |
| IC, 12 x 12..... | per box 7.75 |
| IC, 14 x 20..... | per box 7.50 |
| IC, 20 x 28..... | per box 12.75 |
| DC, 12 ½ x 17..... | per box 5.00 @ 5.25 |
| DX, 12 ½ x 17..... | per box 6.00 @ 6.25 |
| Alfaway Grade..... | per box \$5.25 @ 5.50 |
| IC, 10 x 14..... | per box 5.50 @ 5.75 |
| IC, 12 x 12..... | per box 5.25 @ 5.50 |
| IC, 14 x 20..... | per box 10.75 @ 11.00 |
| IC, 20 x 28..... | per box 6.25 @ 6.50 |
| IC, 12 x 12..... | per box 6.50 @ 6.75 |
| IC, 14 x 20..... | per box 6.25 @ 6.50 |
| IC, 20 x 28..... | per box 12.75 |
| DC, 12 ½ x 17..... | per box 5.00 @ 5.25 |
| DX, 12 ½ x 17..... | per box 6.00 @ 6.25 |

Coke Plates.—Bright.

| | |
|---------------------------------------|---------------------------|
| Steel Coke.—IC, 10 x 14, 14 x 20..... | per box \$4.00 @ \$5.10 |
| 10 x 20..... | per box 7.50 @ 8.00 |
| 20 x 28..... | per box 10.00 @ 10.25 |
| IX, 10 x 14, 14 x 20..... | per box 6.00 |
| RV Grade.—IC, 10 x 14, 14 x 20..... | per box 4.90 @ 5.00 |
| Charcoal Plates.—Terne. | |
| Dean Grade.—IC, 14 x 20..... | per box \$4.67 ½ @ \$4.75 |
| 20 x 28..... | per box 9.25 @ 9.50 |
| IX, 14 x 20..... | per box 5.67 ½ @ 5.75 |
| 20 x 28..... | per box 11.37 ½ @ 11.50 |
| Abecarne Grade.—IC, 14 x 20..... | per box 4.50 @ 4.65 |
| 20 x 28..... | per box 9.00 @ 9.25 |
| IX, 14 x 20..... | per box 5.50 @ 5.75 |
| 20 x 28..... | per box 11.00 |

7 in Boiler Plates.

| | |
|-------------------|-----------------------------|
| IXX, 14 x 26..... | per sheet \$12.50 @ \$12.75 |
| IXX, 14 x 28..... | per sheet 12.75 @ 13.00 |
| IXX, 14 x 31..... | per sheet 14.25 @ 14.50 |

Copper.

Duty: Pig. Bar and Ingot, 4¢; Old Copper, 3¢ per lb. Manufactured (including all articles of which Copper is a component of chief value), 15¢ ad valorem.

Ingot.

| | |
|---------------------|---------------------|
| Lake..... | per lb 17¢ @ 17.50¢ |
| "Anchor" Brand..... | per lb 16¢ @ 16.50¢ |

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887.

| Not wider than | Not longer than | And longer than | Over 64 oz. | 32 to 64 oz. | 16 to 32 oz. | 14 to 16 oz. | 12 to 14 oz. | 10 to 12 oz. | 8 to 10 oz. | Less than 8 oz. |
|------------------|-----------------|-----------------|-------------|--------------|--------------|--------------|--------------|--------------|-------------|-----------------|
| 30—72..... | 25 | 25 | 25 | 26 | 27 | 28 | 31 | 33 | | |
| 30—72..... | 25 | 25 | 25 | 26 | 27 | 28 | 30 | 34 | | |
| 36—96..... | 25 | 25 | 25 | 27 | 29 | 33 | 36 | | | |
| 36—96..... | 25 | 25 | 25 | 26 | 28 | 30 | 34 | 38 | | |
| 48—96..... | 25 | 25 | 25 | 27 | 29 | 31 | 35 | | | |
| 48—96..... | 25 | 25 | 25 | 28 | 30 | 32 | 36 | | | |
| 60—96..... | 25 | 25 | 25 | 30 | 32 | 37 | | | | |
| 60—96..... | 25 | 25 | 25 | 31 | | | | | | |
| 84—96..... | 26 | 27 | | | | | | | | |
| 84—96..... | 27 | 28 | | | | | | | | |
| Over 84 in. wide | 28 | 30 | | | | | | | | |

All Bath Tub Sheets..... 16 oz. 14 oz. 12 oz. 10 oz.

Per pound..... \$0.28 0.30 0.32 0.35

Bolt Copper ¾ inch diameter and over, per pound..... 25¢

Circles, 60 inches in diameter and less, 8 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles over 60 inches diameter, up to 96 inches diameter inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 8 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

14 ounce to square foot and heavier..... 38¢

12 ounce and up to 14 ounce to square foot..... 39¢

10 ounce and up to 12 ounce..... 41¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each..... 8¢

Tinning sheets on one side, 30 x 60 each..... 30¢

For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each..... 15¢

For tinning boiler sizes, 8 in. (sheets 14 in. x 60 in.), each..... 12¢

For tinning boiler sizes, 7 in. (sheets 14 in. x 60 in.), each..... 12¢

Tinning sheets on one side, other sizes, per square foot..... 23¢

For tinning both sides double the above prices.

Planished Copper.

Planished Copper List..... net.

Brass and Copper Tubes.

Seamless Copper..... 50¢

Seamless Brass..... 47¢

¾ inch..... 44¢

¾ inch..... 42¢

¾ inch..... 40¢

¾ inch..... 38¢

1 inch..... 37¢

1 ½ inch..... 34¢

Roll and Sheet Brass.

Discount from list..... 10 @ 15 %

Spelter.

Duty: Pig. Bars and Plates, \$1.50 per 100 lb.

Western Spelter..... 54¢

"Berg-nport"..... 81¢

"Bertha"..... 73¢ @ 8¢

Zinc.

Duty: Sheet, 23¢ per lb.

600 lb casks..... 63¢

Per lb..... 7 @ 7 ½¢

Lead.

Duty: Pig, \$2 per 100 lb. Old Lead, 2¢ per lb. Pipe and Sheets, 3¢ per lb.

American..... 54¢

Newark..... 54¢

Bar..... 53¢

Pipe..... 73¢, dis 20 %

Tin-Lined Pipe..... 1¢, dis 20 %

Block Tin Pipes..... 55¢, dis 20 %

Sheet..... 81¢, dis 20 %

Solder.

1 ½ @ 1 ½ (Guaranteed)..... 23¢

Extra Wiping..... 20¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson..... 14¢

Hallett's..... 12¢

Plumbers' Brass Work.

Discount per cent.

Ground Bibbs and Stops..... 55¢ @ 10¢

Ground Stops, Hydrant Cocks, &c..... 55¢ @ 10¢

Corporation Cocks..... 55¢ @ 10¢

Corporation Cocks, "Mueiler" Pattern, from Western list..... 55¢ @ 10¢

Ground Basin and Shampooing Cocks..... 50¢ @ 10¢

Compression Basin Cocks..... 50¢ @ 10¢

Compression Basin and Sink Cocks..... 50¢ @ 10¢

Compression Pantry Cocks..... 50¢ @ 10¢

Compression Double Basin and Shampooing Cocks..... 50¢ @ 10¢

Compression Double Bath Cocks..... 50¢ @ 10¢

Compression Bibbs, Urinal Cocks, Sill Cocks, Stops, Hopper Cocks, Hydrant Cocks and Ball Cocks..... 50¢ @ 10¢

Basin Plugs and Basin Grates..... 55¢ @ 10¢

Bath and Wash Tray Plugs..... 55¢ @ 10¢

Bath Wastes and Washers, Bath and Basin Valves, Sewer and Vacuum Valves, Closet Valves, Pump Valves and Strainers, Ship Closet Valves and Suction Baskets..... 55¢ @ 10¢

Basin Clamps, Basin Joints and Strainers 55¢ @ 10¢

Boiler Couplings, Ground Face, per set \$1.25..... dis 10

Boiler Couplings, Plain Face, per set \$1.20..... dis 10

Water Back Valve and Plain Couplings, Soldering Nipples and Unions..... 55¢ @ 10¢

Union Joints..... 60¢ @ 10¢

Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and Guides..... 55¢ @ 10¢

Hose Goods..... 55¢ @ 10¢

Steam and Gas Fitters' Brass and Iron Work.

Discount per cent.

Brass Globe Valves..... 60¢ @ 10¢

Finished Brass Globe Valves, with Finished Brass Wheels..... 40¢ @ 10¢

Brass Globe Valves, with Patent Wood Wheels..... 60¢ @ 10¢

Brass Globe Angle and Corner Valves..... 60¢ @ 10¢

Brass Radiator Angle Valves..... 60¢ @ 10¢

Brass Radiator Angle Valves Frink's Patent..... 60¢ @ 10¢

Brass Cross and Check Valves..... 60¢ @ 10¢

Brass Check Valves..... 60¢ @ 10¢

Brass Hose Valves..... 60¢ @ 10¢

Brass and Iron Frink Valves..... 60¢ @ 10¢

Brass Safety Valves..... 60¢ @ 10¢

Brass Vacuum Valves..... 50¢ @ 10¢

Brass Whistle Valves..... 60¢ @ 10¢

Brass Balance, Back Pressure and Foot Valves..... 50¢ @ 10¢

Brass Butterfly and Throttle Valves..... 50¢ @ 10¢

Brass Pump Valves..... 50¢ @ 10¢

Brass Steam Cocks..... 57 ½¢ @ 10¢

Brass Service, Meter and Union Meter Cocks..... 57 ½¢ @ 10¢

Brass Whistles, Water Gauges and Oil Cups..... 60¢ @ 10¢

Brass Hollow Plug, Tallow and Globe Oil Cups..... 50¢ @ 10¢

Brass Lubricators..... 60¢ @ 10¢

Brass Air Valves..... 60¢ @ 10¢

Brass Air Cocks..... 60¢ @ 10¢

Brass Gauge Cocks..... 55¢ @ 10¢

Brass Cylinder Cocks and Steam Bibbs..... 50¢ @ 10¢

Brass Swing Joints and Expansion Joints..... 50¢ @ 10¢

Brass Test Pumps..... 50¢ @ 10¢

Brass Steam Fittings, Rough..... 50¢ @ 10¢

Brass Steam Fittings, Finished..... 2 @ 10¢

Brass Union Joints..... 60¢ @ 10¢

Brass Soldering Unions and Nipples..... 55¢ @ 10¢

Brass Hose Fittings, Fusible and Boiler Plugs..... 55¢ @ 10¢

Iron Body Globe, Angle, Cross and Check Valves..... 65¢ @ 10¢

Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves..... 65¢ @ 10¢

Iron Cocks, all Iron..... 65¢ @ 10¢

All Iron Valves..... 65¢ @ 10¢

Miscellaneous.

Discount per cent.

Cast Iron Fittings..... 70¢ @ 10